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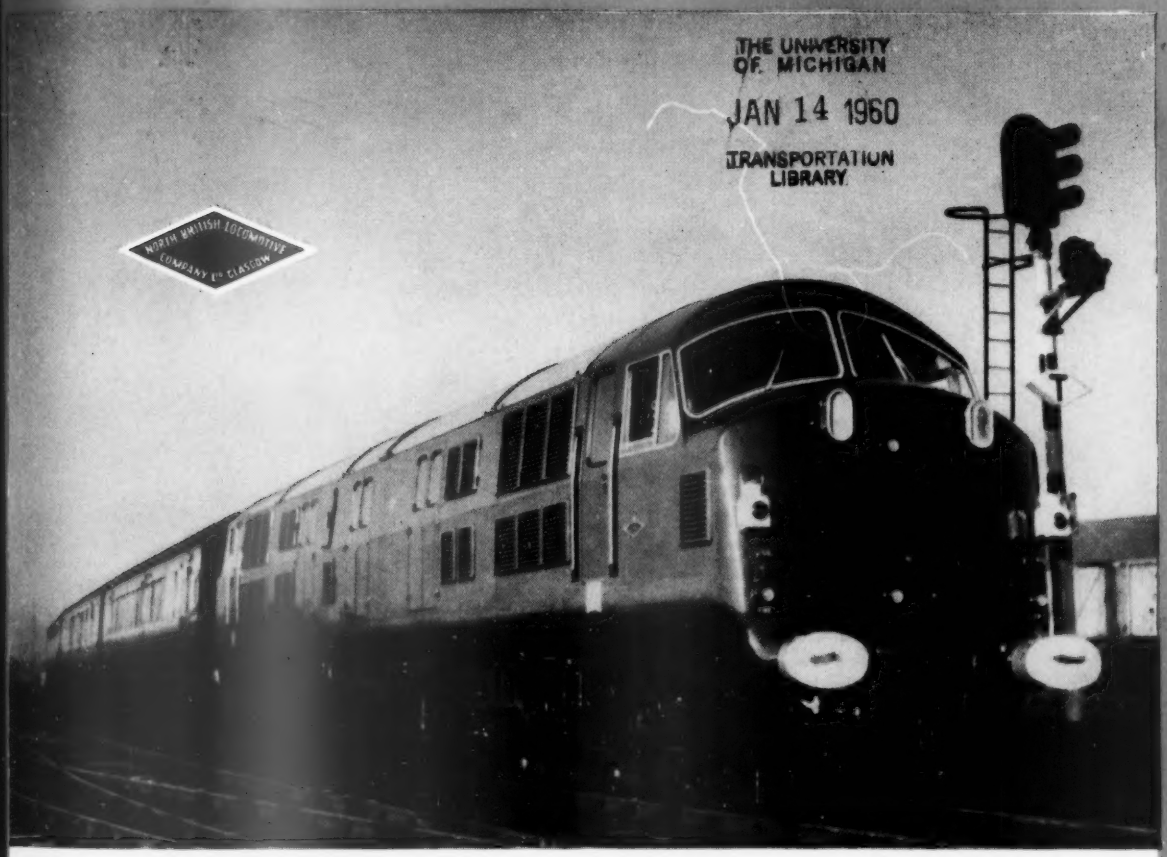

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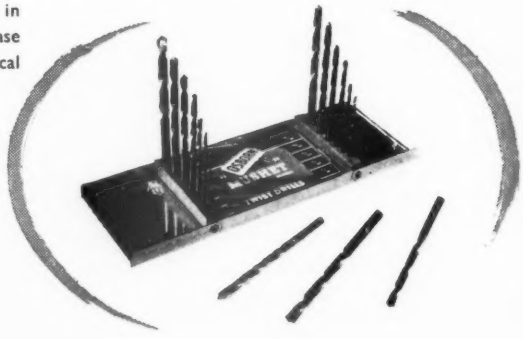

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CONTENTS

	Page
Editorial Notes	557
Reducing Flange-Wear on Bogie Locomotives ...	559
C.I.E. in 1958-59	559
Danish State Railways	560
Brigadier Langley's Annual Report	561
The Scrap Heap	564
Overseas Railway Affairs	565
Electric Traction Section	567
Personal	577
New Equipment and Processes	581
News Articles	583
Contracts and Tenders	585
Notes and News	585
Railway Stock Market and Official Notices ...	588

Improved Railway Labour Relations

TWO important moves toward better understanding in the field of railway labour relations have been made, one by the British Transport Commission and the other by the National Union of Railwaymen. The significance of these gestures should not be overlooked in the general unrest in labour relations which inevitably attracts greater public attention. The Commission has stated its readiness to give an assurance against discharge of redundant staff who were in service on January 1, 1958. The assurance would be given on the understanding that the staff would be prepared to accept offers of alternative employment which might involve a change of work and call for a move to another place of employment. It has been prompted by the Commission's recognition of the fact that anxiety about continuity of employment could affect the men's attitudes to schemes of modernisation and improved productivity. Although the proposition has not been received as wholeheartedly and with as much goodwill as might have been expected, there can be no doubt that, from the union point of view, it is an important development. It should have a beneficial effect on the morale of many of the conciliation grades who must recognise the fact that the total labour force on British Railways has been running down and now probably is approaching the general level at which it may be maintained when modernisation is complete. Another indication of improving relations between Commission and union has been the resumption of joint consultation at all levels. It will be recalled that the N.U.R. decided some months ago to bring to an end the arrangements for joint consultation as a form of protest against the Commission's refusal to operate a closed shop in certain sections of its organisation. The decision was particularly surprising as the right of joint consultation had been a main plank of N.U.R. policy for so long. The union's decision was regretted by the Commission, which has ever since kept open the door to a resumption of the practice of consultation. Only the union could be the loser from the break, and it is clear that this has now been realised, and that wise counsel and more mature consideration have prevailed in the matter.

Mr. A. H. Chilton

ON DECEMBER 31, Mr. A. H. Chilton, a Director of J. Stone & Co. (Holdings) Ltd., and formerly Chairman of its subsidiary company, J. Stone & Co. (Deptford) Ltd., is to retire. Mr. Chilton is one of the inevitably-dwindling band of Britons which has contributed so much to the development of railways overseas. As a young man he went to India and before leaving, 18 years later, he had served on two Indian railway systems as Chief Electrical Engineer. In that capacity, Mr. Chilton laid the foundations of the high standard of train lighting and ventilation which is a feature of railways in India today. The knowledge and experience he gained at that time have been, since 1931, at the disposal of the J. Stone Group, which has supplied, under his direction, a large part of the air-conditioning and electrical equipment to many railways throughout the world. There must be many senior officers on the Indian railways today who learned much from Mr. Chilton during their early careers, and who will join his many other friends in wishing him a long and happy retirement.

Mr. Henry Ernst

AFTER 40 years of service in this country, Mr. Henry Ernst, Chief of the Swiss National Tourist Office, as well as representative of the Swiss Federal Railways in the United Kingdom, is retiring. The popularity he has achieved among a very wide circle of friends was evident at a luncheon given him at the Waldorf Hotel on December 8. Mr. Robert Sinfield, Shipping & Continental Manager, British Railways, Southern Region, who presided, paid warm tribute to the work which Mr. Ernst had done and to the courtesy and friendliness which had marked his relations with all sections of the travel industry. To mark the occasion he made a presentation to Mr. Ernst, and Mr. Charles Holt, Managing Director of Thos. Cook & Son Ltd., who supported the Chairman in the toast, said that one of the many distinctions enjoyed by Mr. Ernst had been the fact that he had represented both the Swiss National Tourist Office and the Swiss Federal Railways. In most cases separate officials had held these appointments, but the Swiss had found it both advantageous and economical to unite these offices in one under the very able direction of Mr. Ernst.

Advancement of Africans on Rhodesia Railway

THE offer made recently by the Rhodesian Federal Government to the Rhodesia Railway Workers Union of a scheme for African advancement is the culmination of many years' negotiation. If accepted it will herald the end of racial discrimination in employment on the railways in Northern and Southern Rhodesia. In effect the proposals extend to the railways the system of advancement which operates in the Federal Civil Service and which has been accepted in principle for the Southern Rhodesia Civil Service. Suitable Africans will be specially trained for specific jobs which now are wholly white. If they prove themselves in training, they will be promoted to the job on a four-year testing period. If in that time they prove their ability to do the job efficiently and display an adequate sense of responsibility they will be confirmed in the job on equal conditions with the whites. If carried out, the proposals will have an incalculable effect in the long term

because the railways are the biggest single employer of labour in the Federation, and what they do in respect of African advancement will set the pattern for others.

Further A.C. Electrification in France

ELECTRIFICATION at 25kV., 50 cycles, now in progress of the Creil to Aulnoye and Busigny to Somain sections of the Northern Region of the French National Railways, with some mileage in the Valenciennes-Somain coalfield area, generally resembles that of the Paris-Creil-Lille line. The total route-mileage is 147. The principal civil engineering work is the raising or reconstruction of overline bridges and flyovers to afford clearance for the overhead equipment, and lowering of the track at some level crossings. Except for one stretch of 1 in 200, gradients do not exceed 1 in 300. Conversion will greatly improve transits between Paris and the industrial areas of Northern France, and Belgium and beyond. It will provide another route from the northern coalfields to Paris, and relieve the existing electrified main line *via* Longueau. The Belgian National Railways are reported to be planning electrification, at 3,000 V. d.c., as elsewhere on their system, from Brussels to Aulnoye, which would result in electric traction, at different voltages, between Paris and Amsterdam.

Overseas Railway Traffics

CANADIAN Pacific Railway revenue for October amounted to $39,068,157 compared with $38,785,895 in October, 1958. Railway expenses were $35,946,250 ($37,440,065) resulting in net earnings of $3,121,907 ($1,545,830). Aggregate net earnings for the 10 months January-October, 1959, were $27,358,864 compared with $26,292,963 in the corresponding period of 1958. Operating revenues of the Canadian National Railways for October amounted to $62,632,000. Expenses, taxes and rents totalled $62,336,000, making the net operating income for the month $296,000. In October, 1958, operating revenues were $62,944,000; expenses, taxes, and rents were $57,243,000, and the net operating income was $5,701,000. Railway operating revenues of the International Railways of Central America for October amounted to $854,917 compared with $1,001,153 in October 1958, a decrease of $146,236. The net revenue from railway operations showed a loss of $305,790 ($131,129 loss) and the net income a loss of $320,243 ($182,435 loss). The latest figures received from the Midland Railway Company of Western Australia Limited show that estimated railway and road service receipts for September 1959 amounted to £A89,392 compared with £A75,601 in September 1958.

New Railway Planned in British Columbia

A RAILWAY link between the U.S.A. and Alaska is one of the purposes of the 700-mile standard-gauge line planned between a point 50 miles north of Prince George, in British Columbia, on the Pacific Great Eastern Railway, and the Yukon border. The route has been surveyed and the Premier of British Columbia, Mr. W. A. C. Bennett, has stated that construction will start shortly, probably in April. This is a separate undertaking to the Peace River hydro-electric power development project, but will be begun simultaneously. The immediate purpose is the economic development of the northern part of the province. The Alaska Highway until recently had been considered as the principal land route between that State and the main body of the U.S.A., but economic development of Alaska may well provide ample traffic for a railway. The terrain is difficult and many major civil engineering works are necessary. Despite the hydro-electric power development in the area, the line will probably be worked by diesel locomotives and railcars.

Uncertainty in Bolivia

THE situation remains unsatisfactory as to operation in Bolivia of the lines owned by the Antofagasta (Chili) & Bolivia Railway Co. Ltd., and those leased from its subsidiary, the Bolivia Railway Company, a U.S.A. corporation. Early this year, as recorded in our February 20 and 27 issues, the British company, to end an intolerable situation in which it had been expected to work the line whilst forbidden to increase its charges to reasonable levels and to dispense with redundant staff, ceased operation of its lines in Bolivia. The Bolivian Government appointed a commission to report at the end of four months or longer. The working of the railway was entrusted to the Government Railway Department, and the Government decreed that losses on working must be imputed to the company, which refused to accept this liability. On October 27, the Government stated that, although the commission had terminated its studies, it was to remain to give advice during negotiations with the company. No copy has been received of the commission's report, though one Bolivian newspaper has published what purports to be the conclusions. The company has not been approached by the Bolivian Government and does not know what solution eventually will be proposed. The railways, which remain the property of the companies, are being operated under fiscal administration in which the companies have no control. The British company is represented in Bolivia by its former General Manager, Mr. G. M. Wilson, and a few senior British employees. It continues to operate its lines in Chile.

Wholesale Conversion of Stations to Halts

CONVERSION of passenger stations to unstaffed halts and ticket issue in trains by conductor-guards so as to reduce expenses have been fairly common on British railways, but wholesale conversions on the scale now proposed by the North Eastern Region are unprecedented. All stations except two, Hornsea Bridge and Hornsea Town, on the Hull-Hornsea line, and one, the terminus, on the Hull-Withernsea branch, are to become halts on January 4. The Transport Users' Consultative Committee for the Yorkshire Area has agreed subject to any reasonable representations for restoration of facilities at any station concerned. Conductor-guards equipped with Setright Register roll ticket machines will issue tickets on the trains. On certain mornings during the summer peak period ticket issue staff will attend at some stations. Details of what is planned, including arrangements for smalls, are given on another page. The experiment will be watched closely. The arrangement is a better one than withdrawal of the passenger services or complete closure of intermediate stations, as has been done in other Regions.

Explaining Train Delays

A FURTHER example of good public-relations work by British Railways, Southern Region, in explaining delays is the new poster relating to the rebuilding of an underline bridge at New Malden. All trains on the main line from and to Waterloo cross the bridge. They include West of England expresses besides many suburban trains. The poster, of a striking orange colour, is being displayed at stations on all the lines affected ranging from Waterloo to Cornwall. It points out that the reason for delays is not engineering work by the railway, but the desire of the local authority to widen the road. Because a temporary structure of beams carries not only the track but also New Malden Signalbox, while the local council's contractors work in the limited space below, trains must reduce speed. To facilitate the more complex operations, some tracks are closed at week-ends and train services must be altered. Even so, progress is bound to be slow, for there is room for only a few men to work simultaneously. The work, it is stated, is likely to continue to cause delays until it is completed next May. Clear, frank, and timely explanations of this kind, giving relevant details, go far to improve relations between the railways and their customers.

A Stationmaster's Job

A COMPREHENSIVE description of his duties was given last week by Mr. P. C. Roberts, Stationmaster at Wrotham & Borough Green, British Railways, Southern Region, in a paper, "My Job," to the Kent Centre of the Institute of Traffic Administration. Wrotham Station, on the Swanley Junction to Maidstone East line, electrified at 750V. d.c., is in a still predominantly rural area, but there is a considerable residential traffic. It has an hourly service of multiple-unit passenger trains, with additional trains at peak hours. Many Folkestone and Dover boat expresses and special workings are being routed *via* Wrotham instead of *via* Sevenoaks and Ton-

bridge because of electrification and other works. Some 72,000 passengers and 60,000 parcels are dealt with annually, and goods traffic includes 18,000 tons of sand. Mr. Roberts is responsible for Kemsing Station and Offham Crossing with a staff of 14. His outline of his duties is well calculated to appeal to an audience concerned with transport, though largely not railwaymen. Under operating he includes the need to maintain the punctuality of an intensive train service with many special workings, and to co-operate closely with the civil engineers in arranging possession of track and other works. Among procedures in an emergency he mentions steps to mitigate delays to passengers such as their relegation to a local inn until the train was due. The commercial duties are well outlined. It is gratifying that he is Vice-Chairman of the Kent Centre of the I.T.A., resulting in many useful contacts with men outside the railway service.

Fostering the Team Spirit

THE great extent and heterogeneous origins of the London Midland Region of British Railways bring to mind the ancient kingdom of Mercia, which formed much of the Region's territory and whose constituent parts also scarcely could be termed homogeneous. Like the London Midland Region's administration, Mercia's rulers must have wondered how to engender that feeling of unity which is so essential to any successful undertaking. There must have been many efforts such as the drive now being made on the East Midlands Division of the Region to build up a good team spirit. Elsewhere in this issue we illustrate a tie which Mr. Brian Gray, Divisional Traffic Manager, Nottingham, has devised in this respect: the qualification for its wearing is employment in one of the Traffic departments—Commercial, Operating, and Motive Power. The design is simple. The British Railways lion and wheel device is on a background of London Midland maroon, while the bow and arrow and the green stripe together represent the East Midlands. Mr. Gray is to be congratulated on what should prove to be an excellent piece of internal relations work.

Reducing Flange-wear on Bogie Locomotives

WITH the general advent of heavy diesel and electric locomotives many factors concerning flange-wear on bogie wheels, which is not generally critical with steam locomotives, must now be taken into account from both the design and maintenance aspects. A fact which mitigates against wear of the flanges of coupled wheels on steam locomotives is that any point on the larger circumference comes into contact with the rail less frequently. Also the bogie on pony-truck wheels which relieve them of much of the guiding force are free of driving motors and other moving adjuncts and are carried in trucks of relatively short wheelbase with an axle-load of only about 10 tons. In such cases excessive flange-wear does not occur although the tyre steel is normally Class " D " of only 56-60 tons per sq. in. tensile strength and a Brinell hardness of 250-275.

The phenomenon of relatively rapid flange-wear on sharp curves with the bogies of Bo-Bo and Co-Co locomotives, and the variety of well-known causes for this, must be accepted pending the results of further research into the reduction of bogie weight and unsprung weight, the height of the bogie centre of gravity, different relative speeds of the axles and motors, weight transfer, and so on. Experiences with modern locomotives on the railways of Brazil, Spain, and Jamaica and experiments to ameliorate any serious tendencies associated with the problem are discussed in a paper " Methods of Reducing Flange-wear on Diesel and Electric Bogie Locomotives " delivered before a meeting of the Institution of Locomotive Engineers in London earlier this week by Mr. W. L. Topham of the Vulcan Foundry Limited, a member of the English Electric Group.

One of the most outstanding of the tentative conclusions reached shows that flange or rail lubrication using a lubricant matched in viscosity to suit the ambient temperature lengthens the flange life from six to nine times, this factor varying according to the tyre steel used. A change from tyres of " D " steel to those of 70-ton tensile steel alone can increase flange life by as much as three times. A combination of lubrication, hard tyres, and the fitting of a centraliser linking the movement of the two bogies and which is capable of drastically reducing flange forces on curves, will improve flange life by 12-15 times. The centraliser tends to equalise the angular displacement of the bogies when negotiating curves, so reducing the tendency for both leading axles to have an auxiliary angle of attack to the rail.

Other tentative conclusions reached by Mr. Topham stress the importance of correct axlebox side-play in three-axle bogies to allow the wheel flanges on the middle axle to be self-guiding; that of maintaining correct flangeway where check rails are provided at the inner rails of curves, for otherwise heavy flange and rail-wear can occur there; and the inner face of the tyre should be perpendicular as far towards the outer diameter as possible because a large run-off at the tip may result in only a line bearing on the checkrail. Also he suggests that for a rail edge radius of three-eighths in. existing radii of flange roots might be reduced, or the former increased, and that further examination should be given to the pattern of positioning traction motors in consideration of the positions adopted by bogies on curves.

Fifteen 3,000-h.p. 3,000-V. d.c. Co-Co English Electric locomotives supplied in 1950 to the then newly electrified Santos Jundiahy Railroad performed excellently, but the tyres, of " D " steel, showed an average rate of wear at first (0·0162 in. per 1,000 miles) which suggested the necessity for tyre turning about every three weeks of arduous service. By adopting some of the methods outlined previously the wear rate was reduced to an average of 0·00102 to 0·00106 which indicated a flange life of 120,000 miles. Much of the initial wear might fairly be attributed to the 100-lb. flat-bottom rails being severely worn on the curves which created considerable excess gauge widening, though in general the road was in good order. The flange lubricant found most suitable to the Brazilian climate was Crater Compound fed initially from a simple cup-type receptacle with a feed-pipe slightly inclined to the horizontal, inside which was a bronze nipple with orifice of three-sixteenths in. diameter. The shaped tip of a steel delivery nozzle was kept in light contact with the flange. A caged-in platform between the locomotive bogies was used by Mr. Topham as a means of closely observing the action of individual wheel flanges under all conditions of service. He remarks that riding only six in. above the track at up to 60 m.p.h. was quite an exciting experience which also enabled valuable data to be obtained.

Sixty electric locomotives supplied to R.E.N.F.E. during 1954-55 are similar to those previously mentioned and were fitted with the hard wheel tyres as initial equipment. There too the use of flange lubrication, but with heavy engine oil, and the standardisation of bogie centralisers have reduced flange-wear to such an extent that the wheels might run indefinitely were it not for normal treadwear. Also, the centralisers have reduced flange forces to such an extent that there has been an outstanding diminuition of wear in the bogie mechanical parts and general equipment.

On the Jamaica Government Railway the 10 Bo-Bo 750-h.p. English Electric locomotives put into service in 1956 with diesel-electric power, the location of the fuel tanks precluded the fitting of bogie centralisers. But mileages of 70,000 miles between tyre turnings are expected as a result of adopting flange lubrication with Bunker " C " sludge, and rail-wear which was excessive at first has now subsided to normal.

C.I.E. in 1958-59

THE Chairman of Coras Iompair Eireann, Dr. C. S. Andrews, has sent us a copy of his board's report for the 12 months ended March 31, 1959. During the year the Transport Act, 1958, took effect. The purpose of this Act, the report states, is to re-organise C.I.E. to enable it to pay its way. To facilitate re-organisation, provision was made for a subvention during a transition period of five years. The obligation was laid on the undertaking to work within the fixed subvention until March 31, 1964, and thereafter to pay its way. Five months of the financial year had elapsed before the new board, re-constituted to give effect to the provisions of the Act, assumed its duties on September 1, 1958. Dr. C. S. Andrews was appointed Chairman in succession to Mr. T. C. Courtney, who had resigned but continues as a Member of the board. Mr. W. McMullen and Mr. M. F. Molony, who were Directors of

the Great Northern Railway Board, were appointed members of the board of C.I.E., which from January 1, 1960, on withdrawal of County Donegal Joint Committee train services, will work all railways in the Republic.

A major event of the year was the coming into operation on October 1, 1958, of the Great Northern Railway Act, when that part of the G.N.R. railway system which lay in the Republic of Ireland, and road services and other G.N.R. assets in the Republic, came under the control of C.I.E. Railway services crossing the border were worked by C.I.E. in conjunction with the Ulster Transport Authority. Motive power and rolling stock of the former G.N.R. were divided between the two undertakings. Dundalk Works was vested in the Industrial Engineering Co. Ltd., and all G.N.R. staff except employees at Dundalk Works became employees of C.I.E. By the end of the financial year the former G.N.R. road and rail services had been integrated into C.I.E. services.

Where appropriate, the principal results given below include the G.N.R. figures. Comparative figures for traffic and receipts for the six months ended March 31, 1958, were not always available in suitable form and instances are estimates.

	1957–58	1958–59
	£	£
Railways—		
Passenger receipts	2,982,574	3,112,175
Goods receipts	3,977,000	3,904,192
Miscellaneous receipts	58,512	62,101
Total receipts	7,018,086	7,078,468
Expenditure	8,038,504	8,247,533
Loss	1,020,418	1,169,065
Road Passengers—		
Receipts	5,687,428	6,151,038
Expenditure	5,297,911	5,407,626
Net receipts	389,517	743,412
Road Haulage—		
Receipts	1,859,817	1,768,287
Expenditure	1,781,585	1,686,803
Net receipts	78,232	81,484
Canals, loss	64,290	79,071
Docks & Harbours, loss	10,471	13,076
Hotels, Refreshment Rooms & Restaurant Cars, net receipts	39,574	44,173
Total loss	2,588,074	1,798,917

On appointment the new board of C.I.E. made an assessment of the position with a view to giving effect to the obligations imposed by the Act of 1958. The early months of the new undertaking were devoted to this task and to the acquisition of G.N.R. assets and services. By December, 1958, a new policy had been developed ready to go into effect in January, 1959. This policy has been mentioned in several issues of this journal. It includes the exploitation of the new commercial freedom of C.I.E., and a campaign for traffic was launched in January. Other aims are improvement in the appearance and cleanliness of rolling stock and buildings, enhancing the morale and efficiency of the staff, elimination of waste, and review of management methods and organisation. A new organisation structure has been planned and steps taken to introduce it.

Railway passenger receipts increased from £2,982,000 to £3,112,000, partly because of a fares increase in May, and partly because of the incidence of the Easter holidays. Bad weather affected excursion traffic. The number of first class passengers declined further. The Dublin Harcourt Street to Bray passenger service was withdrawn on January 1. There was a serious decrease in livestock traffic as the result of a fall in cattle exports, and of the growth of private transport. Coal traffic declined for various reasons.

The policy of maintaining and improving passenger facilities was continued. The conversion to diesel working which has been steadily contributing to better running times and more economical working was extended by commissioning two "C" class 550-h.p. diesel-electric locomotives, and one "E" class 400-h.p. diesel-hydraulic locomotive. Work was begun on the conversion of six coaches to holiday camping coaches.

The bridge carrying the main Dublin-Belfast line over the North Wall branch was renewed. The first railway bridge of this type in Ireland, it has a span of 32 ft. with three all-welded main girders. The bridge over the Lough Ree canal at Athlone, which has a 35-ft. span, was replaced by a deck-type structure. This was fabricated at Inchicore and was erected during a single week-end.

Work study was introduced in June, 1958, into the railway workshops at Inchicore with the assistance of a firm of industrial consultants. Although the unions and the men, on the whole, co-operated in the introduction of this new technique, an unofficial strike of fitters took place when work study was applied in the diesel locomotive overhaul shop. This dispute ended after 12 weeks after causing a considerable disruption of the maintenance programme. On the resumption of work, work study was re-started in the locomotive overhaul shop.

Danish State Railways

THE year ended March 31, 1959, showed an increase of about 3 per cent in the number of passengers carried by the Danish State Railways. This increase was practically all in the Copenhagen suburban area, where 79,400,000 passengers were conveyed compared with 76,500,000 the preceding year. The rise was mainly in season and weekly tickets issued. The number of tickets sold to or from foreign countries constantly increases. This year it rose from 3,500,000 to 3,800,000, mostly for travel to and from Sweden, but journeys to and from other parts of Europe also show a considerable increase.

Some of the results for 1957-58 and 1958-59 are given below:

	1957–58	1958–59
Miles open	1,750	1,750
Passengers (millions)	110·1	113·1
Goods (million tons)	6·99	7·58
Train-miles (millions)	24·1	24·0
Operating ratio	105·3	104·0
	Million kroner	
Passenger receipts	254·9	264·8
Goods receipts	174·3	181·2
Gross receipts (all services)	527·9	549·1
Working expenditure	556·0	571·6
Net deficit	28·1	22·5
Deficit after charges	96·1	97·3

Goods traffic revived, rising by 8·5 per cent, mainly, it is considered, because of good economic conditions in the country. All traffics showed increases, including a large movement of sugar beet from Denmark to Germany in the autumn of 1958.

Rationalisation has led to a further reduction in staff of about 200, caused mainly by introduction of more diesel locomotives. This was more than counterbalanced by increases in salaries and wages from April 1, 1958, so that expenditure to staff went up by about 20,000,000 kroner. The extent of the changeover from steam to diesel traction may be seen from the fact that steam traction only accounts for 3,300,000 train-miles against 5,000,000 in the preceding year, while the number of train-miles accounted for by diesel haulage rose from 16,500,000 to 18,000,000. It is expected that steam traction will be abolished in a few years except for extra trains at peak holiday periods.

The ferry service is still growing. The 24 ferryboats and other ships made 46,800 round trips on the two Great Belt crossings between Korsør and Nyborg (16 miles) and between Halsskov and Knudshoved (12 miles). An average of 49 round trips was made on these routes and the traffic amounted to 5,660,000 passengers, 38,300 railway passenger vehicles and vans, 360,000 goods vehicles and 876,000 motorcars; the last figure shows an increase of 110,000 against last year. The State Railways bus routes show an increase in traffic.

To counterbalance the considerable rise in salaries and wages introduced from April 1, 1958, and also to bring the rates and fares system in accordance with international regulations the Rigsdag (Parliament) passed a law, under which the rates and fares on the Danish State Railways were increased from August 1, 1959. Ordinary fares were raised about 20 per cent. Return fares are now at 1·5 times single fare, compared with 1·7 times before August 1. The supplement for travel by express trains has been abolished. Season ticket charges were increased by about 15 per cent. For the carriage of road freight vehicles on the ferries the increase in charges is about 10 per cent. The same applies to the carriage of passenger cars and buses, though there is no increase in the period September to May, where there is sufficient space available on the ferryboat. In June-August the peak traffic necessitates a larger number of ferries, and to encourage travel during the slack periods the rates have been increased in the three summer months. Goods rates have risen by about 20 per cent for less-than-wagonload traffic. For wagonloads the increase is about 10 per cent. The same time the number of goods classifications has been reduced from seven to four.

Brigadier Langley's Annual Report

THE report for the year 1958 of the Chief Inspecting Officer of Railways, Brigadier C. A. Langley, records a decrease in "train" accidents, compared with 1957, from 1,205 to 1,186, but some increase in resultant casualties. There were, however, only 36 fatalities against 112 in 1957 which included, of course, the 90 deaths arising from the serious accident at St. Johns. These 36 fatalities included 18 passengers, of whom 10 lost their lives in the Dagenham collision and 13 other persons, occupants of road vehicles traversing level crossings, and five railway servants. There were 223 "train" accidents at crossings, of which 169 were collisions with gates across the line and 54 with road vehicles, 42 of them at occupation crossings. Only two occupants of road vehicles lost their lives at public crossings, but 11 did so in seven accidents at occupation crossings, while 13 pedestrians were killed at all types of crossing, including footpaths. A formal inquiry was held into the accident at Funtham's Lane occupation crossing on April 27, 1958, when three persons in a motor-car were killed, as the case presented peculiar features. The report on it recommended that powers be sought to provide automatic half-barriers. Figures, last revised in 1957, show that there were some 4,667 public crossings, of which 281 were without gates and confined to lines where rail speeds are low and traffic light, with 19,701 occupation or accommodation type crossings, at which the great majority of accidents arise from irresponsible action on the part of the public. "The increase in the accidents at manned public crossings," the report states, "emphasises the problem of maintaining safety on account of manning difficulties . . . the Minister has been given powers to authorise the Transport Commission to modify the equipment of level crossings, which includes the replacement of manned gates, either by half-barriers worked automatically by the trains, or by full-length barriers operated from near the crossing or remotely from a signalbox." Experiments with half-barriers are to be undertaken and "the future programme will depend on the result. . . ." It is understood that the British Transport Commission, although having as yet no fixed programme for it, will replace the old heavy-type gates by barriers as renewals become due and in certain other cases as resources shall permit.

Analysis of the "train" accidents shows human failure to have been responsible for 52·5 per cent, a little more than in 1957. Train crews had to answer for 166 collisions and 72 derailments—against 168 and 65 in 1957—while failures of signalmen accounted for 23 and 15 respectively, against 24 and 14 in the previous year. Technical defects, in many cases with human failure associated, brought about seven collisions and 95 derailments, and 41 other accidents, 12 per cent of the total, rather more than in 1957. Accidents attributable to other causes, 420 in all, were 36 fewer than in 1957 and 250 arose from irresponsible action on the part of the public. There was an appreciable increase in the cases due to snow, landslides and floods. Fires in trains numbered 44, well below the 1957 total of 71, and very much below the 1951-1955 average of 141; one, however, in a Central Line train led to the death of a passenger. The report on it contained important recommendations and no time was lost in implementing them.

Total route-mileage at the opening of the year was 19,192, and fell in the course of it to 19,075 by closure of unremunerative branch lines, but none of the electrification schemes included in the modernisation plan was brought into use, although great strides were made with the work, leaving electrified route miles virtually unchanged at 1,008. Reduction of traffic, with more efficient working, brought a fall in the numbers employed by British Railways and the London Transport Underground of 4 per cent to 572,860. Passenger journeys increased slightly but passenger miles fell by 3·5 per cent; total main line train mileage declined from 382 to 376 millions. Permanent way renewals were well maintained and 2,017 track miles—excluding L.T. lines—were wholly or partially renewed, compared with 2,005 in 1957. Some 1,147 route miles were laid with flat-bottom rails, bringing their total mileage to 8,846

TRAIN ACCIDENTS: PRIMARY CAUSES

—	Collisions	Derailments	Running into obstructions	Fires in trains	Miscellaneous	Total
1. Failures of train crews (including guards):—						
(a) Passing signals at danger	23	17	11	—	—	51
(b) Other irregularities or want of care:—						
(i) Enginemen	115	45	41	1	13	215
(ii) Guards	27	7	8	—	—	42
(iii) Enginemen and guards	1	3	3	—	—	7
2. Failures of signalmen:—						
(a) Irregular block working	11	1	—	—	—	12
(b) Other irregularities or want of care	12	14	22	—	1	49
3. Failures of other staff:—						
(a) In traffic departments	38	8	78	1	1	126
(b) In other departments	4	3	25	—	3	35
4. Failures of train crews and signalmen	21	6	5	—	—	32
5. Failures of train crews and other staff	12	3	15	—	1	31
6. Failures of signalmen and other staff	4	5	4	—	—	13
7. Faulty loading	3	7	—	—	—	10
8. Technical defects:—						
(a) Engines	—	11	2	8	5	26
(b) Vehicles:—						
(i) Drawgear	—	12	1	—	2	15
(ii) Other	4	32	3	10	—	49
(c) Defective track	1	34	1	—	3	39
(d) Defective signalling apparatus	2	6	1	—	—	9
(e) Defective structures (other)	—	—	5	—	—	5
9. Other causes:—						
(a) Snow, landslides, floods	—	6	13	—	1	20
(b) Animals on the line	—	—	79	—	—	79
(c) Responsibility of the public:—						
(i) Irregular opening of doors	133	—	19	—	1	153
(ii) At level crossings	—	—	58	—	1	59
(iii) Other	1	2	28	3	4	38
10. Miscellaneous	22	10	16	21	2	71
Total	434	232	438	44	38	1,186

or 25 per cent of the running lines; the proportion in high-speed lines is considerably greater. There was an increase in accidents arising from passing signals at danger—these had been declining since the war—leading occasionally to serious consequences. Referring to the equipment now being installed under the name, long used, of automatic train control Brigadier Langley observes that this expression has "led many people to think that it is a device for controlling automatically the movement of the trains, thereby virtually eliminating accidents. This is not the case but the system is a valuable aid to drivers in the observance of signals, especially in bad weather, and provides an automatic brake control in the event of a driver failing to take charge from illness or other cause"; he proposes therefore to refer to it in future as "the automatic warning system (A.W.S.) of train control." In 1958 six accidents caused by passing signals at danger might have been prevented had the equipment been in operation at the locations concerned. In one case the ground apparatus was in place but the colliding locomotive not fitted to work with it. The report records steady progress with the installing of the British Railways standard system. By the close of this year it will be in operation over 530 route miles—making with

the lines equipped with the Western Region apparatus some some 2,000 in all—and some 2,000 steam and diesel locomotives will have been fitted to work with it.

Accidents for which signalmen were primarily responsible increased from 46 to 61, but occasioned the same number of collisions and derailments, 38, as in 1957; 12 were due to irregular block working, marked in some cases by inexcusable negligence. "There were, however," says the report, "several failures by signal engineers' linemen which led to accidents that might have had serious results." After pointing out how modern equipment of the latest type is becoming rapidly extended, Brigadier Langley remarks that it "incorporates a complexity of automatic and semi-automatic electrical devices and makes the task of the railway signal engineer even more onerous than it has been in the past and calls for meticulous care in the installation, repair and testing. . . ." He records with satisfaction that "particular attention has been paid to this" and prompt action taken "to deal with any cases where staff fail to comply with the safety regulations and live up to the high standards set to them by this branch of the railway profession." Although unfortunately the accidents resulting from technical defects increased in 1958 mainly on account of defective track and signalling apparatus, they were still, at 143, below the average for 1951-1955, which was 159.

Fifteen formal inquiries were found to be necessary compared with 11 in 1957. The report contains concise details of the essential facts in each case, but as the individual reports were summarised in our columns, with diagrams, shortly after publication only a few remarks on the more noteworthy cases are given here.

Collision in Fog at Dagenham

The collision in a fog at Dagenham on January 30 arose from a driver passing a starting signal at danger and entering irregularly a section in which a signalbox had just been switched out. This resulted in clear indications being received at the distant signals for that box and an intermediate block signal which it controlled, both confirmed by the automatic warning system. Unfortunately, this became repeated at the distant signal for the next open signalbox, just become cleared behind the train ahead, overtaken as it was moving slowly forward. Ten passengers were killed. The case called for very careful investigation as it was possible that an irregular "line clear" release might have been transmitted, as was witnessed by Brigadier Langley during tests. He concluded, however, that nothing of the kind occurred, for to assume it did pre-supposed collaboration and untruthfulness on the part of three signalmen, which seemed most unlikely. Recommendations were accepted by the railway authorities regarding the sending of trains to starting signals in fog and the procedure for switching signalboxes out of circuit. A collision arising from a signalman's carelessness occurred on a branch line near Ince Moss Junction on February 17, when a train became admitted to a section occupied by a light engine. Fortunately, it had not

CASUALTIES IN TRAIN AND MOVEMENT ACCIDENTS

—	Total	Killed				Injured				All casualties per million train miles	
		Total	Passengers	Railway servants	Other persons	Total	Passengers	Railway servants	Other persons	Killed	Injured
1915–19	6,122	616	174	341	101	5,506	1,731	3,600	175	1·8	16·5
1920–24	6,638	407	92	248	67	6,231	2,577	3,518	136	1·1	17·0
1925–29	7,526	368	91	210	67	7,158	3,733	3,267	158	0·9	18·0
1930–34	7,440	308	74	183	51	7,132	4,394	2,592	146	0·7	17·0
1935–39	8,376	338	86	198	54	8,038	5,342	2,576	120	0·8	18·0
1940–45	1,222*	477	141	254	82	745*	256*	455*	34*	1·2	1·9*
1946–50	8,878	347	91	204	52	8,531	5,647	2,763	121	0·9	21·2
1951–55	7,910	295	90	165	40	7,615	5,199	2,315	100	0·7	18·6
1946	9,529	413	120	236	57	9,116	5,691	3,281	144	1·0	22·6
1947	9,203	409	148	218	43	8,794	5,871	2,785	138	1·1	22·9
1948	8,683	340	87	191	62	8,343	5,554	2,678	111	0·9	20·9
1949	8,651	285	44	188	53	8,366	5,640	2,625	101	0·7	20·2
1950	8,329	290	60	187	43	8,039	5,483	2,446	110	0·7	19·5
1951	8,176	283	97	158	28	7,893	5,328	2,482	83	0·7	19·2
1952	8,470	386	160	180	46	8,084	5,505	2,472	107	0·9	19·7
1953	7,771	306	66	185	55	7,465	5,051	2,304	110	0·7	18·0
1954	7,558	211	40	139	32	7,347	5,029	2,229	89	0·5	17·8
1955	7,573	288	89	162	37	7,285	5,083	2,089	113	0·7	18·3
1956	7,529	237	49	147	41	7,292	5,166	2,044	82	0·5	17·7
1957	8,149	320	138	151	31	7,829	5,565	2,195	69	0·7	18·7
1958	8,231	206	51	122	33	8,025	5,859	2,080	86	0·5	19·5

* Serious injuries only

ACCIDENTS, EMPLOYMENT, AND OPERATING STATISTICS

—	Class 1		Railway servants (March)	Passenger journeys originating (incl. season tickets)			Freight-tonnage originating (excl. free hauled)	Ton-miles (incl. free hauled)	Miles operated				Passenger miles (estimated)	
									Main line railways			London Transport: Train		
	Train accidents	Failures of rolling stock or permanent way		Total	Main line railways	London Transport			Train	Shunting	Other		Main-line railways	London Transport
	Number		Thousands	Millions										
1920–24 ...	1,009	11,153	699[2]	1,848	—	—	303	17,457	369	121	28	—	—	—
1925–29 ...	941	9,141	679	1,661	—	—	298	17,562	401	123	29	—	—	—
1930–34 ...	796	5,772	602	1,612	—	—	270	16,060	416	113	27	—	—	—
1935–39[1]	745	4,149	592	1,733[3]	1,255[3]	478[3]	281	17,230[3]	412	115	29	32	18,993[4]	2,297[4]
1940–45[1] ...	387	160	604	1,661	1,210	451	288	23,844[5]	356	124	37	26[6]	33,191[7]	2,608[7]
1946–50 ...	1,250	4,382	658	1,692	1,075	617	271	21,295	372	111	39	33	26,464	
1951–55	1,200	2,743	609	1,574	986	588	283	22,300	374	99	39	34	24,101	
1951 ...	1,280	3,436	622	1,624	1,001	623	285	22,902	376	104	40	35	24,302	
1952	1,243	3,022	625	1,574	989	585	285	22,391	376	101	40	35	24,048	
1953	1,123	2,675	616	1,565	985	580	289	22,766	379	100	40	34	24,143	
1954	1,197	2,504	600	1,566	991	575	283	22,089	378	97	40	34	24,235	
1955	1,156	2,080	586	1,543	967	576	274	21,353	363	92	38	35	23,777	
1956	1,226	2,009	593	1,577	1,005	572	277	21,473	376	92	38	36	24,546	
1957	1,205	1,679	596	1,630	1,076	554	274	20,878	382	91	39	35	25,923	
1958	1,186	1,612	573	1,642	1,065	577	243	18,426	376	85	37	35	25,025	

[1] Having regard to the altered basis under the Modification Order, fewer accidents were reportable and only serious damage is included as from September 1, 1939, to December 31, 1945. The comparison is unchanged as regards traffic, movement and staff employed
[2] Four years, 1921–1924
[3] Four years, 1935–1938
[4] For year ended August, 1939, only
[5] Estimate for main lines—1942–1945
[6] Loaded only
[7] Three years, 1943–1945

yet attained much speed; its guard nevertheless was killed. The light engine driver had been waiting some time for a conductor driver without taking steps to protect himself. What is called the "Welwyn" block control would have prevented the mishap but local conditions did not justify priority for it on this branch. A colour-light signal was overrun in daylight in clear weather at Gloucester Road Junction on March 4 by a steam train which collided with an electric one running under clear signals at a converging junction. Its driver had been correctly advised that he was to be routed differently there and said he was aware of the alteration; it was concluded that he became momentarily confused. As the signal had been overrun several times certain controls and the junction interlocking were altered, to leave no doubt in a driver's mind as to which route he was to take and prevent any collision resulting, should nevertheless an overrun occur.

Contravention of block regulations, combined with failure to see that a signal had not responded to its lever and other action, resulted in a collision at Chinley on March 8 with injuries to 8 passengers. The signalmen at each end of the station had formed the habit of working irregularly, confirmed by a comparison between registers and drawing attention to the value of periodical cross checks, now ordered to be effected twice yearly.

Fatal Crossing Accident

The fatal collision at the Funtham's Lane occupation level crossing on April 27, already mentioned, raised several important issues. The crossing had come to be used by as many as 500 motor vehicles and 400 motor and other cycles every day with some 90 trains passing, and its gates were regularly left open by users. Indicators, found to have been in proper order, showed when a train was approaching and ordered road users to stop, with various fixed warning notices, etc., some obscured by certain equipment. The crossing was not, however, conspicuous and the car driver, not a local resident, probably turned along the road, believing it to be a public one affording a convenient way to his destination, unaware that it crossed the railway. Possibly he did not see the crossing until quite close to it or the electric indicators at all. Notices were at once erected indicating that the lane was private and afforded no through road and certain other useful steps taken, but it was felt that they could be but palliatives and that further remedial measures were called for. Diversion of the lane was impracticable and it was considered that, apart from continuous manning with interlocked signals, automatic half-barriers offered the only solution to the problem. It was recommended therefore, to have their adoption at such a location legalised. The matter, however, is still under discussion with the Regional authorities. A case of a motorman failing to stop at a well-sited semaphore after seeing its distant at caution and colliding at appreciable speed with some empty stock being shunted over 500 yd. beyond and doing much damage, with injuries to 45 persons, occurred at Maze Hill on July 4. The guard clearly also was not keeping the lookout required of him. As mentioned in the annual report for 1957, the problems raised by this kind of seemingly unaccountable lapse are being specially investigated by the B.T.C. assisted by a panel of scientific experts, with full trade union support.

Electrical Fire in Tube Train

The electric fire in a tube train at Holland Park on July 28, also referred to above, believed to be the most severe of its kind to occur in such a train, showed that certain opinions by which the design of equipment and layout of the wiring had hitherto been guided were incorrect and no delay occurred in applying the lessons taught by the exceptional incident, by which a passenger was fatally affected by fumes. Improvements in the means of communication between motormen and traffic controllers were immediately put in hand, while essential alterations to existing stock and the application of indispensable protective measures were carried out with expedition. Weak points in certain rules and regulations also were eliminated.

At Eastbourne on August 25 a serious collision with five fatalities was caused by a steam train driver, who observed the adverse distant signal, overrunning the home and striking an electric train about to start. His speed was excessive, even for clear signals, and his lapse incomprehensible. Overrunning of an automatic semaphore signal, which improvements had left located among colour-lights, on the part of a goods train driver, occurred near Hitchin on November 19. He failed to keep a proper lookout, mismanaged the brakes, and overtook another goods train where thick fog had come on and behind which a signalman had left his distant signal at clear for some minutes. This man had been over 10 hr. in the box working a 12-hr. shift, owing to staff shortage. The difficulty has since been overcome and normal shifts instituted. Twelve-hour turns, unfortunately, are still unavoidable in some areas and it is hoped that further efforts will be made to eliminate them. The capsizing of a contractor's crane on the line at Urmston on December 11, followed by a double collision, revealed weaknesses in the arrangements for warning approaching trains and co-ordinating the activities of those concerned in road bridge building of the kind in progress there. It was recommended to extend the powers of the Factory Inspectorate to cover not merely the bridge works themselves, as at present, but also equipment such as cranes, etc., used alongside railway property, on the approach roads and their connections. The question of the use of flares to give emergency warnings should, it was thought, be once more investigated.

Other Cases

As usual, the report gives particulars of a number of accidents dealt with by correspondence by the Inspecting Officers, disclosing a variety of operating faults, some serious, including irregular block working, indiscipline in operating on a single line, misreading of signals with, in one case, failure to act on an audible cab warning, insufficient care when moving under a calling-on aspect, mistakes made by linemen when attending to equipment, leading to the ignoring of safety rules and so on. Of the fires in trains particular interest attaches to one in a diesel car where broken electrical connections resulted in the automatic extinguisher failing. The arrangements now are such that it is not possible to start a car when such a fault exists.

Accidents to Servants

The report records a further reduction in "movement" accidents to servants which totalled 2,076, the lowest yet recorded, of which 117 were fatalities, as against 2,243 in 1957. The figure of 117 killed is the lowest by a wide margin, the previous lowest being 144 in 1956. This marks a reduction of 27 per cent on the 1957 figure. The injured include 952 persons involved in coupling and uncoupling vehicles or other shunting accidents, and 376 hurt while attending to engines in motion, but in over 75 per cent of the cases injuries were slight. Many such accidents were attributable to misadventure; a few to defective equipment or materials. Others arose from lack of individual care, a failing difficult to counteract. The necessity for constant vigilance is always impressed on the staff at inquiries and every means should be taken to publish as widely as possible information regarding the circumstances of accidents. It is a supervisor's duty at all times to set a proper example and correct anyone seen making mistakes. Of the 34 fatalities to staff struck by trains when at work 16 were attributable to want of vigilance while seven befell men who knew a train to be approaching but acted incorrectly. The lookout man being himself at fault occasioned six fatalities and four arose from inadequate protection. One incident revealed a discrepancy between the B.R. and L.T.E. Rule Books, necessitating amendment of the latter. Although an analysis of causes does not indicate any precise reasons for the improved situation, Brigadier Langley feels it to be "due primarily to the staff's having become more safety conscious, as a result of the united efforts by the Commission and the Trades Unions to impress the value of accident prevention." A study group, formed in 1955 "has done much to publicise safety measures and at meetings between management and staff full opportunity is constantly taken to discuss safety. At their many inquiries the Railway Employment Inspectors have also impressed the staff with the necessity for unceasing vigilance for personal safety." The reduction in casualties experienced in 1958 is indeed most heartening, but leaves "no room for complacency, because most of the accidents were the result of individual carelessness." Total fatalities arising from all movement on rail amounted to 0·5 per million train miles against 0·7 in the previous year.

THE SCRAP HEAP

Prize Suggestion

A successful works suggestion scheme is operated at its Manchester works by Small & Parkes Limited, makers of Don brake linings and disc brake pads. Money awards are made to employees who submit suggestions which are adopted, and there is also a " Best Suggestion of the Year " prize. In the 10 years in which the scheme has operated over 1,100 suggestions have been made, of which almost 600 have been adopted. An out-of-the-ordinary suggestion was submitted recently by Mr. H. Kirkpatrick, of the Engineer's Shop. He advocated the packing of brake lining rivets in transparent plastic bags to replace existing linen bags. This method is much cheaper; eliminates labelling, as the contents can be seen; and is generally much more efficient. His suggestion has brought Mr. Kirkpatrick an award of £170, calculated on expenditure saved, with £10 for the " Best Suggestion " prize.

Plea for Veteran Locomotive

A last-minute reprieve may save *Dido*, the veteran Palmerston North, New Zealand, railway engine, from being broken up for scrap. The small engine drew the Napier mail train in the 'nineties. In its last years *Dido*—officially WA68—was a shunter at Palmerston North railway yards. For three years it has stood on a siding, forlorn and neglected. Shortly it is to have its last run of all—in a train of derelict engines to Wellington to be broken up.

Because of the small engine's early service to the Hawkes Bay line, there is a feeling in Napier and Hastings that it should be preserved. Prominent citizens of Hastings envisage that it should be placed in the children's playground there and overtures are to be made to the Railways Department for a stay of *Dido's* execution.

Riding the Buffers

A soldier was fined £5 at Bletchley for riding on the buffers of a passenger train and travelling without paying his fare. He stated that he was trying to get to Glasgow. He was seen on the buffers when the train was passing Bletchley Station.—*From the " Evening Standard."*

Collapse of a Running Shed

One blustery day (October 30) in 1863, at 3.30 in the afternoon, a gust caught New Cross Engine Shed, L.B.S.C.R., and blew it flat. The high wind rushed down the line, through the open doors of the shed and, unable to escape, blew off the roof. The 145-ft. long building collapsed covering the eight engines in the shed with rubble and overturning one. A driver and fireman escaped death by scrambling into the ashpit beneath their locomotive to lie motionless as it turned over a few inches above them. A cleaner who was in the shed was killed by masonry as he ran for safety. Several men in the shed were injured, three of them seriously. Outside, tons of brickwork blocked the local line, and a passing express was chipped by flying fragments. In the inquiry that followed railway inspectors read with astonishment the dimensions of the fallen building—14-in. thick brickwork, with massive 23-in. brick piers every 20 ft. They attributed the collapse to several tons of coke banked against one of the walls of the shed which pushed it down when the roof lifted.—*From the " South London Press " of December* 8, 1959.

Photo] *[Winton Keay*

Derelict steam locomotive " Dido ", which hauled the Napier mail train, Palmerston North Railway, New Zealand, in the latter part of last century

London Midland Divisional Tie

Divisional tie for members of East Midlands traffic departments (editorial note on page 559 refers)

Bird of Passage

Birds are often killed by fast-moving vehicle surfaces, but can also dodge wheels. On a locomotive in Suffolk I saw a kestrel go down under the front buffer beam, then out between the coupled wheels, unhurt. The speed of the train was about 50 m.p.h.—*From a letter to " The Daily Telegraph."*

Traffic Competition on B.B.C. TV.

Mr. Arthur M. Johnston, Publicity Manager of Hayward Tyler & Co. Ltd., of Luton, obtained a free fortnight's holiday in Sark for his wife and himself by winning the " Panorama " Traffic Competition on December 7, on B.B.C. television, from among 6,000 entrants. His prize-winning scheme for reducing traffic congestion was framed under four headings: (1) methods of transferring traffic from road to rail; (2) more effective use of the British road system; (3) improved car parking facilities, as on the perimeter of large cities to induce incoming traffic to make use of public transport for remainder of journey; and (4) abolition of the 30-m.p.h. limit and substitution of specially surfaced roads at approaches to built-up areas to make speeds above about 25 m.p.h. impossible.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

RHODESIA

Extended "Railstar" Service

On November 30, Rhodesia Railways extended its popular "Railstar" Express Service to Northern Rhodesia, which is designed to carry urgent goods traffic without extra charge. The Inter-City "Railstar" was inaugurated in January this year and operates in both directions on the Salisbury-Bulawayo line with connections to Umtali and Fort Victoria. Many users have expressed their satisfaction at the service given.

"Railstar North" brings rail transit times from Salisbury to Ndola to within 60 hr. while from Bulawayo the transit time is 40 hr. At Lusaka, Ndola and Nkana-Kitwe there is a guaranteed collection and delivery service similar to those operating successfully in Bulawayo and Salisbury. At Livingstone the present cartage arrangements are being continued.

The "Railstar" train has a net capacity of 300 tons every day all the way from Salisbury to the Copperbelt. It is scheduled to cover most of the 1,075 miles journey at mail train speed.

INDIA

New Eastern Railway Stations

Between August, 1958 and July, 1959, three new stations and seven new halts on the Eastern Railway were opened to traffic and three halts converted into flag stations. Booking facilities were extended to two crossing stations. Out-agencies were opened at Maldah and Bhabua Town and one for goods traffic only at Palasipara. An out-agency has also been opened at Karimpur.

WESTERN AUSTRALIA

"Westfreight" Express

The "Westfreight" is the name given by the Western Australian Government Railways Commissioner, Mr. C. G. C. Wayne, to the express goods train which conveys Eastern States traffic from Kalgoorlie to the metropolitan area. Three named trains are now in service on the Western Australian Government Railways, the other two being the "Westland" Interstate express and the "Australind," Perth-Bunbury express.

The "Westfreight" express leaves Kalgoorlie each Monday, Tuesday and Thursday at 5.30 p.m. and delivers wagon loads and containers to metropolitan goods depots the following morning. A through express goods service enables traffic from Melbourne to reach Perth within 10 days. The use of cargo-tainers eliminates transhipping individual consignments and further reduces this transit time to six or seven days. The "Westfreight" express detaches en route wagon load consignments to forwarding agents at Maylands, Perth and Subiaco.

Reduced Fares for Winter

Rail fares between Perth and Eastern States capitals have been reduced for the months of May, June and July, 1960. The first class return fare, including meals, sleeping berths and reserved seats from Perth to Melbourne, at present £55 15s., will be reduced to £52 1s. for this period. Second class return fares have been reduced from £37 18s. 6d. to £35 7s. 7d. Perth-Brisbane fares have been cut by £3 15s. 3d. and £2 11s. 7d. respectively. The first class return fare from Kalgoorlie to Melbourne has been reduced from £45 2s. to £41 8s. 2d. and the second class fare from £30 6s. 6d. to £27 17s.

These reductions are being granted during the three winter months when patronage, generally, is light and when ample accommodation is available. The reduced rates will apply on all tickets issued for travel on or after May 1 and not later than July 31, 1960. Travel on the return portion of the ticket will be permitted any time within three months from the date of travel on the forward journey. Bookings for the first trains on which these reductions apply opened on November 1.

VICTORIA

Richmond Station Modernisation

Another phase of the large-scale works programme in the Richmond area, estimated to cost from some £3,000,000, was completed recently when a new island platform was opened for traffic. The platform, the third of five planned for the new station, is being used temporarily by Box Hill and Eastmalvern trains. This will enable the remaining portion of the old Richmond Station to be demolished immediately and speed up the construction of the fourth platform for permanent use by the Box Hill group of lines. Later the third platform will revert to use by Caulfield group line trains, enabling an additional pair of tracks to be brought into operation between Flinders Street and South Yarra.

Satisfactory progress is also being made on the first phase of the project to provide additional tracks between Flinders Street and East Camberwell. Work is now in hand on the third track between Hawthorn and East Camberwell. Sub-structures for the new bridges to carry it have been completed at six locations and erection of steel work commenced last month.

Lease of Railway Land

Tenders are being invited by the Victorian Railways for the lease of 1¾ acres of land with frontages to Barkers Road and Hawthorn Grove, Hawthorn. The land, which is the old Barker railway station site, is suitable for the erection of flats, or purposes approved by town planning authorities. Strong financial interests have already made inquiries about acquiring the land, which may be leased for 50 years, with an option of a further 20 years.

ARGENTINA

Strike by Signalmen

During the latter part of October and early November, train services were disrupted over the whole country by a series of partial strikes of signalmen, who, in definance of the instructions given by their Union, insisted in their attitude to back up demands for a re-classification of wage scales. After a series of progressive stoppages, starting from half an hr. a shift and ultimately reaching 2 hr. a shift, they started working to rule, finally reinitiating the progressive stoppages. The Government finally de-

The "Westfreight" express nearing Perth after its overnight run from Kalgoorlie

cided to dismiss all signalmen who failed to carry out their duties normally, with the result that all services were disrupted. Finally, a compromise was reached, the men returned to work, dismissals were cancelled, and talks were started with the intervention of the Union so that a satisfactory solution could be found. Emergency services were carried out on a limited scale but only about 40 per cent of the normal services could be organised.

BRAZIL

Braganca Railway Extension

Congress has authorised an extension of the Braganca Railway, in Para, to link it up with the Sao Luis-Teresina Railway, which serves the States of Maranham and Piaui. The cost is estimated at 100,000,000 cruzeiros.

Settlement of Railway Disputes

The Brazilian Foreign Office has announced that the French and Brazilian governments have agreed to set up arbitration courts before the end of 1959 to pronounce on the indemnities due by Brazil in respect of the seizure of the Sao Paulo-Rio Grande and Victoria-Minas Railway Companies and the Port of Para Company. The two governments will also take immediate steps to settle the disputes relating to the Bahia Docks Company and the Brazil Railway.

Sr. Antonio Goncalves de Oliveira, Legal Advisor to the Republic, has left for London to contest the claims of the shareholders of the Ilheus-Conquista Railway, which was acquired by the Brazilian government in 1949. In 1955 the Commission appointed to negotiate with the company's representatives proposed paying the sum of £565,000, agreed to in London in 1949, less the amount of £90,750 which the " Scheme of Arrangements " reserved for payment to intermediaries in Brazil for services rendered in furthering the sale.

ITALY

Milan-Turin Electrification

At the recent timetable conference covering train services in North-west Italy down to the Ligurian coast, held recently at Turin, it was officially revealed that the electrification of the double-track Milan-Turin main line (95 route-miles) has enabled the introduction of electric traction to be fixed for spring, 1961, when also the work of converting the 65-mile Turin-Modane main line from three-phase 16 2/3 cycles a.c. to 3,000 V. d.c. will be completed.

WESTERN GERMANY

New Train Starting Indicators

The so-called " order staff," a handle with a circular disc at one end and a small green light by night, used in several Continental countries by the platform official to give the signal to start, is being superseded at many important stations by illuminated signs or indicators of various forms. On the German Federal lines these take the form of a circle of eight green lamps on the starting signal post which can only become lighted if that signal is itself at clear for the train. The platform official has a key which he inserts in a contact box carried on one of the roof stanchions or other convenient support. At places where electric trains and railcars operate an additional sign is being provided in the form of a white illuminated letter " T," meaning *Türen schliessen* (close the doors), to indicate to the motorman or driver that he is to do that. These arrangements have been found not only to accelerate the working but to reduce risk of mistake and accident now that so many variously coloured advertising signs tend to make the observation of hand signals difficult at some locations.

U.S.S.R.

Gas-Turbine Locomotive

A 6,000-h.p. gas-turbine locomotive is being built in the U.S.S.R. for the use of the Russian Railways. Comprising two C.C. units, the locomotives will have a total weight of 252 tons, a normal speed of 62 m.p.h., and will be able to haul a 4,000-ton train up a gradient of 1 in 100 at a speed of 14 m.p.h. The locomotive will be fitted with radio equipment.

Publications Received

Model Railways as a Pastime.—By Gerald Pollinger, London: Souvenir Press Limited, 94, Charlotte Street, W.1, 8¾ in. by 5½ in. 136 pp. Price 15s.—Few adults have not at some time studied the absorbing hobby of model railway operation, but for those who are not actively engaged in it and need up-to-date guidance on the choice of gauge and system of electrical control and operation from the many available, this work should be of value. It also contains a bibliography, a list of model railway clubs and organisations, and a guide to the models available. Here the important distinction is made between freelance proprietary models and scale models manufactured for those who are insistent on perfect accuracy of detail and proportion relative to the gauge of track. All gauges up to 24 in. are listed and scales up to 6 in. to the ft. For guidance in making line-side buildings and scenic effects there are useful notes on the suitability of various adhesives and materials.

Brush 1,365-h.p. A1A-A1A Diesel-Electric Locomotive.—This 10-page publication, No. 71110, issued by the Brush Electrical Engineering Co. Ltd., Loughborough, gives a detailed description and specification of the A1A-A1A diesel-electric Brush locomotive developed for British Railways and classified as their Type "2." Illustrations show sub-assemblies and major components, including the 1,365-b.h.p. JVS 12T diesel engine of Mirrlees, Bickerton & Day Limited, with its twin Brush turbo-chargers and 900-kW. traction generator. There are several illustrations of final assembly and painting in progress and of the locomotives hauling passenger and goods trains in the Eastern Region of British Railways. An unusual driver's eye view shows the field of unrestricted frontal vision. Drawings include leading dimensions.

Electroplated Coatings of Nickel & Chromium.—This British Standard publication, B.S.1224:1959, is a revised edition of one first issued in 1945. Revision is mainly in regard to the provision of thicker coatings of the nickel undercoat, upon which corrosion-resistance largely depends, and the inclusion of more stringent laboratory tests. The object of the revision is to help to overcome complaints about the lack of durability of many bright plated surfaces. Nine tests prescribed include those to ensure that the plated finish will not easily peel away even under bending and vibration in these conditions. In addition to the established methods of gauging thickness by testing samples to destruction, attention is drawn to the value of the B.N.F. thermo-electric instrument described in our December 11 issue, which uses non-destructive methods for routine production-control purposes. A table details minimum local thicknesses of nickel coatings for various base metals and to meet the requirements of three quality grades, for the identification of which a labelling scheme has been devised by the Mond Nickel Co. Ltd. An appendix gives notes on the design of components suitable for electroplating. Copies, price 5s. may be obtained from the British Standards Institution, 2, Park Street, London, W.1.

E.S.C. Willison Automatic Coupler.—The construction and operation of Willison automatic couplers manufactured by the English Steel Castings Corporation Limited, for mining and industrial locomotives and rolling stock, is clearly explained in this 24-page publication. Diagrams show angling and gathering between vehicles on curves of tight radius and where there is severe vertical displacement because of differential loading and sharp changes of gradient. Several forms of simple operating gear for uncoupling, designed to meet the specific requirements of certain industries, are illustrated in use on mine cars at the pit head and elsewhere. Rope-haulage clips and steel- and rubber-spring draftgears are also shown. There are reproductions of dimensioned typical arrangement drawings and a full material specification is given. Copies may be obtained from the English Steel Corporation Limited, River Don Works, Sheffield, 9.

ELECTRIC RAILWAY TRACTION SECTION

A. C. Electrification in Scotland

ELECTRIFICATION on the 50-cycle a.c. system in the Glasgow Suburban Area, British Railways, Scottish Region, has presented many unusual problems which sets it apart from other work being carried out on British Railways. Of the 70 route miles being electrified North and South of the River Clyde, some 63 per cent of the track is curved and there are some three miles of tunnels on the route. The higher speeds planned under electrification have involved extensive track improvements particularly on curved sections where re-alignment and recanting is in progress. It would have been quite impossible to provide the necessary electrical clearances for the standard 25-kV. working in the tunnel sections under the city; consequently, the central area of the scheme was designed for operation at 6·25 kV. It will, therefore, become the first a.c. high-voltage electric scheme to work underground in Britain, and emphasises the difficulty which British Railways engineers have to face in providing adequate clearance for a 25-kV. overhead system. The necessity to supply long stretches of line in built-up areas and through tunnels at 6·25 kV. further complicates the rolling stock equipment as automatic devices must be provided for selecting the correct transformer primary connections.

The voltage change-over switch is incorporated in the main transformer. This alters the supply tapping on the auto transformer to correspond with the main incoming voltage at either 25 kV. or 6·25 kV. The change-over switch is automatically controlled by an automatic power control system (A.P.C.) which consists essentially of a track magnet, a receiver on the bogie of the stock, and a line voltage transformer which feeds a number of voltage selecting relays. The auto transformer feeds a step-down transformer which in turn supplies the main rectifiers.

As in the London Midland Region scheme two types of catenary construction have been used each catering for a particular speed restriction. On lines where the limit is 60 m.p.h. or less, simple catenary is used. Where the speed restriction is over 60 m.p.h. compound catenary construction consisting of catenary, auxiliary, and contact wire is used. Structures for the overhead equipment fall into several categories dependent on the loading and track conditions, but an unusual feature is the use of combined structures for overhead contact wire and signal equipment on the approaches to Glasgow Central Station. This shows the degree of co-operation in pre-planning between the Chief Civil, the Chief Mechanical & Electrical, and the Signal Engineers.

The rapid progress made with the erection of overhead structures is due largely to the extensive use of mechanical aids. An augur borer is capable of drilling holes in any type of ground except hard rock, and with boring, mast-planting, and concrete-mixing units built up into a works train the whole process of mast erection can be carried out in a continuous operation as the train passes along the track.

The installation of colour-light signalling is an essential requirement to exploit to the full the potential of electric traction for the operation of fast trains on close headways, and its installation is being carried out on all running lines to be electrified on both the north and south of the River Clyde. This form of signalling used in close conjunction with 50-cycle traction, with a contact wire voltage approaching double that usually employed hitherto, has brought further difficulties because of the interference liable to be experienced. Much thought and many experiments were needed to overcome these problems, and large sums have been expended in cabling, providing screening devices, booster transformers and so on, and designing new track circuit apparatus.

With a scheme of this magnitude the vital need for co-operation and co-ordination cannot be over emphasised. The occupation of part of the line, sometimes for long periods, means that fewer lines are available for running trains, and a great deal of careful planning is needed to avoid delays. Minutely detailed as the planning has to be, it must still be flexible to allow for last-minute alterations which sometimes are bound to occur. The result of this detailed planning is that delays to passenger services have been kept down to a remarkably small level, and it is confidently expected that an electric service will be introduced on the north side of the Clyde during the summer of 1960, and on the south side during the summer of 1961.

Fifty-Cycle Traction Studies in the U.S.S.R.

WHILE studying automatic control in Soviet industry last May, a team of six British engineers from the British Conference on Automation & Computation visited the department of the Institute of Mechanics, Leningrad, which is concerned with electric traction. Their report, which is obtainable from the Honorary Secretary of Group "B" of the conference, care of The Institution of Electrical Engineers, shows that investigations are proceeding both in connection with 50-cycle traction motors and with various aspects of rectifier systems. French and Swiss experience with 50-cycle motors is being followed closely, and designs for a machine of this kind appear to be based on an Oerlikon 16-pole motor similar to the type developed by that company for the original French National Railways 50-cycle electrification in the Savoy, and fitted later to further S.N.C.F. Co-Co locomotives for that part of the system. The Soviet machine is to have a rating of some 1,166 h.p., and with an 18-pole frame will have an armature core 2 ft. 9½ in. in diameter and 1 ft. 5 in. long, and a commutator 2 ft. 2 in. in diameter. The visitors were told that it is proposed to reduce commutation problems at starting by designing the machine to have a characteristic of rising torque with speed, and a fixed value of interpole shunt appears to be contemplated. There is no further clarification of how this modification of characteristics is to be obtained, or what effect it will have on the performance of the locomotive as a traffic unit. Indeed, the attitude was that commutation was not a source of trouble except where easily-rectifiable mechanical faults existed, and the visiting team considers that such optimism about the possibilities of commutator motors may be unjustified. There seems no reason to quarrel with this conclusion when it is recalled how much trouble commutation may give even, in conventional d.c. motors.

The other line of development at the institute concerns rectifier control schemes, in which a study of some interest concerns the use of ignitrons to provide a.c. at variable frequency for traction motors. A parallel proposal is to provide a variable frequency from a generator running at constant speed, the report observing in this connection that there is some concern about possible difficulties with ignitrons at very low temperatures. Tentative suggestions have been heard in this country for obtaining phase-conversion and frequency conversion with semi-conductors, which would remove the rectifier problem and might prove an attractive proposal in many parts of the world as yet uncommitted to a.c. electrification. Work is also in progress at the institute on methods of regenerating through locomotive rectifiers by operating them as inverters, and this is a subject in which practical experience will be gained from some of the 5,500 h.p. Co-Co goods locomotives being supplied to the U.S.S.R. by the French group, Matériel de Traction Electrique. Although the report contains no evidence of major advance in 50-cycle technique in the Soviet Union compared with other countries, there is no ground for complacency here. The evident interest in Continental practice and the references to Continental literature deserve to be noted (although our own issue of March 13 this year is quoted among references to rectifier practice, presumably in connection with our description of the S.N.C.F. dual-frequency locomotives). Clearly a steady flow of detailed technical information is required to engage international attention, and while the British Railways Electrification Conference next year will show what has been accomplished and what is in hand, it is to be hoped that no manufacturer or organisation will be inhibited by the approach of this event from keeping the technical world fully informed of important developments in the meantime.

XUM

Progress of Electrification in the Scottish Region

Civil and electrical engineering work in the Glasgow suburban area

New power-operated signalbox under construction at Glasgow Central Station

ELECTRIFICATION in the Glasgow Suburban Area, British Railways, Scottish Region, on the 50-cycle a.c. system, is on the former L.N.E.R. lines along the North side of the River Clyde between Airdrie and Helensburgh *via* Singer and Yoker including the Milngavie and Balloch branches and offshoots to Springburn, Bridgeton Central and Hyndland. For engineering reasons a diversion is being made to the former L.M.S.R. line at Dunglass between Bowling and Dumbarton where the two lines run close together. On the South side of the River Clyde the scheme embraces the routes from Glasgow Central Station to Neilston High, to Kirkhill on the Cathcart-Newton line, and round the Cathcart Circle. Some 52 route miles are being electrified North of the river and some 18 route miles South of the river. About 63 per cent of the track in this mileage is curved and there are some three miles of tunnels on the route. The latter are in the Glasgow City area, under the Forth and Clyde Canal at Knightswood and Dalmuir, and at Dalreoch and Kirkhill.

Provision for Overhead Clearance

At 119 road and rail overbridges and footbridges on the route of the North side of the River Clyde, and at 63 bridges on the South side of the river, the requisite clearance for the overhead electrical equipment was not available and subsequent planning has been based on reconstruction at 114 sites, raising of the superstructure at 34, removal at four, alterations at two, and track lowering at 28. In 15 cases it was necessary to obtain Parliamentary powers to carry out the work. Three of the bridges carry trunk roads over the railway.

The majority of the bridges needing reconstruction were masonry arches and the method adopted has been to demolish the existing structure, to build up the abutments, and to provide a new superstructure with a flat deck of prestressed concrete beams with precast reinforced concrete parapets. Demolition has been carried out by normal methods or in suitable locations by the use of explosives.

Temporary Bailey bridges have been constructed where diversions of traffic on major roads have not been possible. The work is proceeding in accordance with the phased programme and completion on the North side of the river is scheduled for the end of 1959. Most of the new work has been done by contract. All curved track on the route has been surveyed, and re-alignment and recanting is progressing according to plan.

Where lifting of the track has not been possible because of local restrictions, strengthening has been and is being achieved by the use of the ballast cleaning machine. Extensive reballasting and lifting has been done and, where lowering has been necessary, sand blanketing with its associated drainage, has been incorporated in the work. Track drainage improvements elsewhere have been provided as necessary.

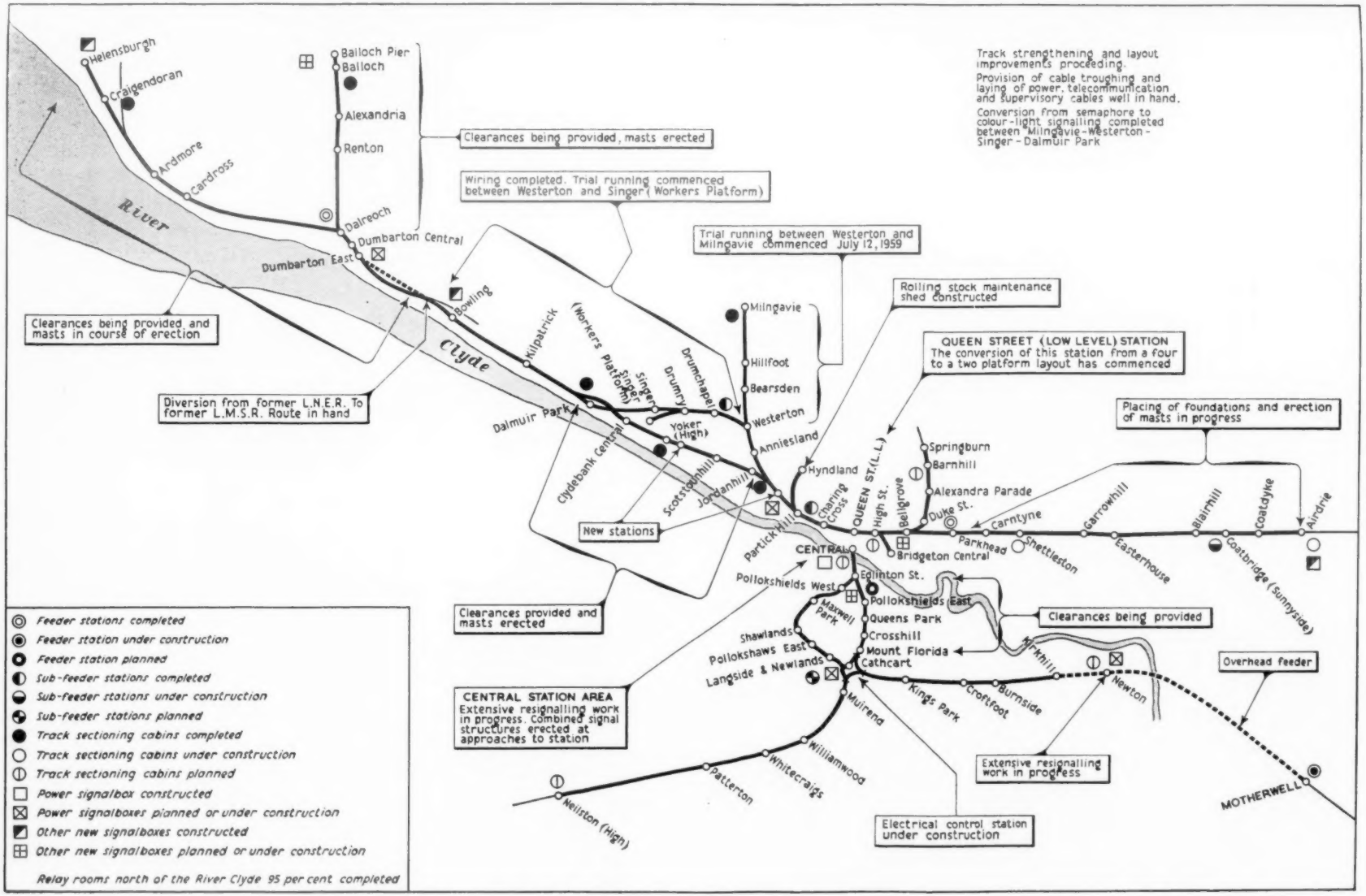
Track Layout Alterations

Major track layout remodelling schemes at Bellgrove and Helensburgh and schemes of less magnitude at Heatheryknowe, Bridgeton Central and elsewhere have been programmed for completion in collaboration with the phasing of the Signal Engineer's work.

Track layout alterations in the preliminary phase work for the re-designed approaches to Glasgow Central Station have been completed with the adjustment of existing tracks to provide clearance for the combined overhead equipment and signal structures which have been erected in this area.

The Civil Engineering costs involved in providing the necessary electrical clearances for the standard 25-kV. work-

Foundation excavation being bored by a diesel-powered augur unit



Glasgow Suburban Area, British Railways, Scottish Region, showing location of engineering works

ing would have been prohibitive in certain places apart from being impossible in the tunnel sections under the city, consequently, the central area of the scheme was designed for operation at 6·25 kV. With the exception of one minor structural alteration, the necessary electrical clearance for this voltage has been provided throughout the tunnel area on the North side of River Clyde by track lowering. At Knightswood Tunnel carrying the Forth and Clyde Canal over the railway, major drainage work has been carried out to prevent flooding after lowering track—already heavily graded into the tunnel from both sides. Arrangements have been made for the completion of the short diversionary connecting line at Dunglass before the end of 1959.

The first phase in preparation for the conversion of Queen Street Low Level Station at Glasgow from a four-platform station to one of two platforms was completed on August 16. The original layout consisted of two tracks at each end of the station diverging to four through the platforms, the two on the North side being used for trains in the Airdrie direction and the two on the South side for trains in the Helensburgh direction. The alteration involved the abolition of the two North side tracks and the conversion of the remaining South side tracks to up and down line. Further phases of the work involve the abolition of the centre island platform, the widening of the North and South side platforms, and modernisation of the station.

Concrete placer delivering mixed concrete to form a foundation for a planted overhead line mast

Rolling Stock Maintenance

At Hyndland a new rolling stock maintenance shed and store has been built. It is of steel framed construction with conventional steel truss type roof supporting double skin asbestos cement sheeting and glazing and with brick sides. The shed encloses three inspection pit roads each holding a six-car set, and is sited to enable future extension to nine-car sets as necessary. The requisite siding accommodation outside the shed has been provided. A building to include offices and staff amenities is about to be constructed at this depot.

On the introduction of the electrified services, the present Hyndland Station will be closed to passenger traffic and will be replaced by a new station on the main line near the junction with the Hyndland branch line. The new station will consist of an island platform with accesses from both sides of the line, one of which will be a subway construction for a part of its length. A new station of simple construction is also being built at Garscadden between Scotstounhill and Yoker. Work at both sites has been started. Alterations to platforms and provision of protective works on lineside structures is proceeding.

The electrical control station for the area has been sited at Cathcart. Work on this building is nearing completion. New signalboxes have been constructed at Airdrie, Bowling, and Helensburgh, and are in course of construction at Bellgrove and Balloch. Signalboxes are being planned for erection at Muirhouse and Cathcart, South of the River Clyde. The construction of two power signalboxes at Dumbarton and near the new station at Hyndland is nearing completion. The operating room of the boxes has been given due prominence in the design, and to achieve this feature and to overcome unfavourable site conditions, the construction has been based on reinforced concrete framework.

At Glasgow Central Station a new power signalbox has been constructed for the resignalling of the station approaches consequent upon the projected removal of the older part of the two sections of the rail bridge over the River Clyde. Site conditions dictated that to obtain the necessary accommodation the building should be in four floors containing control room, relay and equipment room, and power house. The building is designed as a monolithic reinforced concrete structure faced with grey brickwork.

Other buildings required for the electrification, such as feeder stations, sub-feeder stations, track sectioning cabins and relay rooms, have been or are being constructed with the exception of a few on the South side of the River Clyde which are in the planning stage.

At certain stations which will be served by the electrified service, prototype signs have already been erected, and consideration will be given to their general application after public reaction has been obtained.

Overhead Line Equipment

On lines where the speed restriction is 60 m.p.h. or less, simple catenary construction is used. Where the speed restriction is over 60 m.p.h. compound catenary construction consisting of catenary auxiliary, and contact wire is used. On normal open track B.F.B. (Broad Flanged Beam) masts are used. The sizes are 6 in. x 6 in., 7 in. x 7 in., and 8 in. x 8 in. depending on the loading. At overlap spans where two equipments have to be supported double channel masts are used. These are made up of two lengths of 9 in. x 3 in. or 12 in. x 3½ in. channel, with spacers welded between.

At the mid point of tension lengths, where there are more than two tracks, and in station areas, portal structures are used. These may have B.F.B., double channel or four-angle welded rod masts, and booms, dependent upon the loading. At tensioning points, balance weight anchor masts are used. These masts are specially designed to withstand the along-track loading of the equipment. Masts are either planted in the foundation to a depth of at least 5 ft. or are secured by bolts set in the foundation.

Where, because of ground conditions, it is desired to eliminate all side thrust on the foundations, portal structures with pin joined masts are used. In areas where mining subsidence is active or is anticipated, special bolted base masts having allowance for adjustment are installed. On the approaches to Glasgow Central Station a number of combined overhead equipment and signal structures have been erected. These structures have been designed to accommodate signals as well as to support and register the overhead line equipment.

Location of Overlap Spans

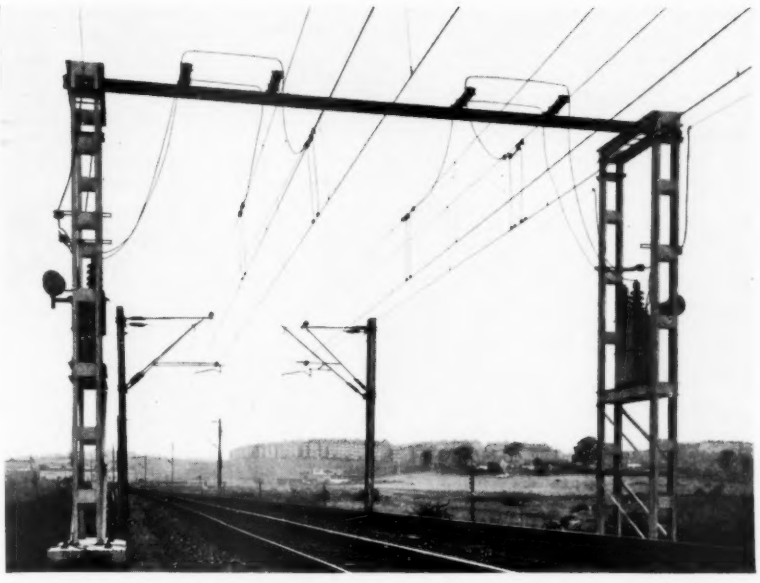
Overlap spans are situated at the ends of tension lengths in the overhead line equipment. On weight tensioned equipment, location of these spans is dictated by the maximum length of equipment between the mid point anchor and the overlap. This length varies with the track curvature and the maximum allowed is 2,880 ft. on tangent track, thus spacing the overlaps at 5,760 ft. maximum. On fixed tensioned equipment the spacing of the overlaps is generally greater. Overlap spans are also located where a break in the overhead equipment is

required for switching purposes.

At a switching overlap the two equipments which terminate at the overlap are insulated from each other. At overlaps where there is no switching the two equipments are linked by a jumper and are electrically common. Neutral sections are installed where there is a change of voltage or a change of phase in the electrical supply. There are two types of construction for neutral sections. One is the carrier wire type which gives a "dead" section of 274 ft. The other is the section insulator type which has a "dead" section of 120 ft. Neutral sections are switched such that the "dead" section can be made "live" at the voltage or phase of the section ahead in event of a train coming to stop with its pantograph on the "dead" section.

In Stage I of the scheme neutral sections are located as follow:

North—Dalmuir Park (25 kV./6·25 kV.)—section insulator
Westerton (25 kV./6·25 kV.)—carrier wire
Yoker (6·25 kV./6·25 kV.)—carrier wire
Finnieston (6·25 kV./6·25 kV.)—section insulator
Parkhead (25 kV./6·25 kV.)—carrier wire
South—Kings Park (25 kV./6·25 kV.)—carrier wire
Muirend (25 kV./6·25 kV.)—section insulator



Structure mounted booster transformers positioned in centre of overlap spans

Excavation and Mast Erection

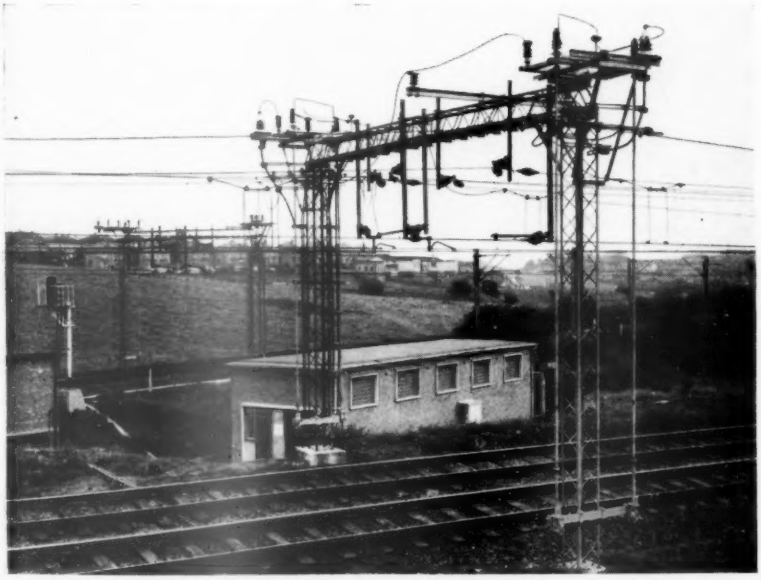
Mechanical aids are used wherever possible but in certain instances foundations have to be hand excavated. An auger unit used as a mechanical aid consists of a separate power producing unit driving an earth auger; this consists of blades on the end of an adjustable arm which swings out from a weltrol on which the machine is mounted. It is possible to drill holes in any type of ground except hard rock, and the auger is capable of drilling holes varying from 2 ft. to 3 ft. 6 in. in dia. to a depth of 12 ft. in 6 min. or less for the average foundation. It is possible to drill holes up to 14 ft. from the track centre. The core is made in a series of operations, the auger being retracted rapidly and the spoil spun radially around the mouth of the hole from which it is removed.

To keep pace with high speed drilling of foundations and erection of masts, a special concreting train has been built. The train consists of a centrally placed batch-weighing concrete-mixing unit and water supply, with specially adapted wagons on either end supplying sand and aggregate on conveyor belts, a cement storage van, and a generator van providing electric power.

Two electrically driven mixers alternate in feeding concrete into the hopper of the hydraulic placing unit, which can deposit the mixed concrete up to 14 ft. 6 in. from track centre. If the spoil has to be removed from site the concrete placing unit can perform a dual role. The concrete delivery bucket is detached from the placing unit and a faced shovel substituted. This will pick up one-third of a cu. yd. at one bite and load it into wagons. This, however, necessitates possession of two tracks.

There are other works trains for the erection of overhead fittings, wire, and so on, and pantograph wagons for clearance testing and grading of the overhead equipment. To date 2,750 foundations have been installed, 2,350 masts and booms erected, and 40 single-track miles of overhead wire erected and tensioned.

The overhead line is divided into sections at neutral sections, overlaps, section insulators, and insulated knuckles. The sections can be connected by outdoor switches. These switches are mostly hand operated by a handle rotating a torque rod which in turn rotates the switch blade. Motorised switches will be employed at neutral sections and certain remote locations. These will be controlled remotely from the control station.



Isolating switches and 25-kV. sealing ends mounted on the overhead line gantry on the Milngavie Branch

Power Supply Arrangements

Power supplies will be taken at 25 kV. single phase, 50 cycles, from the Electricity Authority network through duplicate feeders at Parkhead, Dalreoch, Motherwell, and Eglinton Street Feeder Stations. The switchgear controlling the incoming supplies is similar to that used throughout the electrification and, although owned and maintained by the Supply Authority, will be situated in the railway feeder stations and will be incorporated in the railway switchboards.

To provide an incoming supply in the Airdrie area a sub-feeder station will be situated at Coatbridge (Sunnyside) con-

XUM

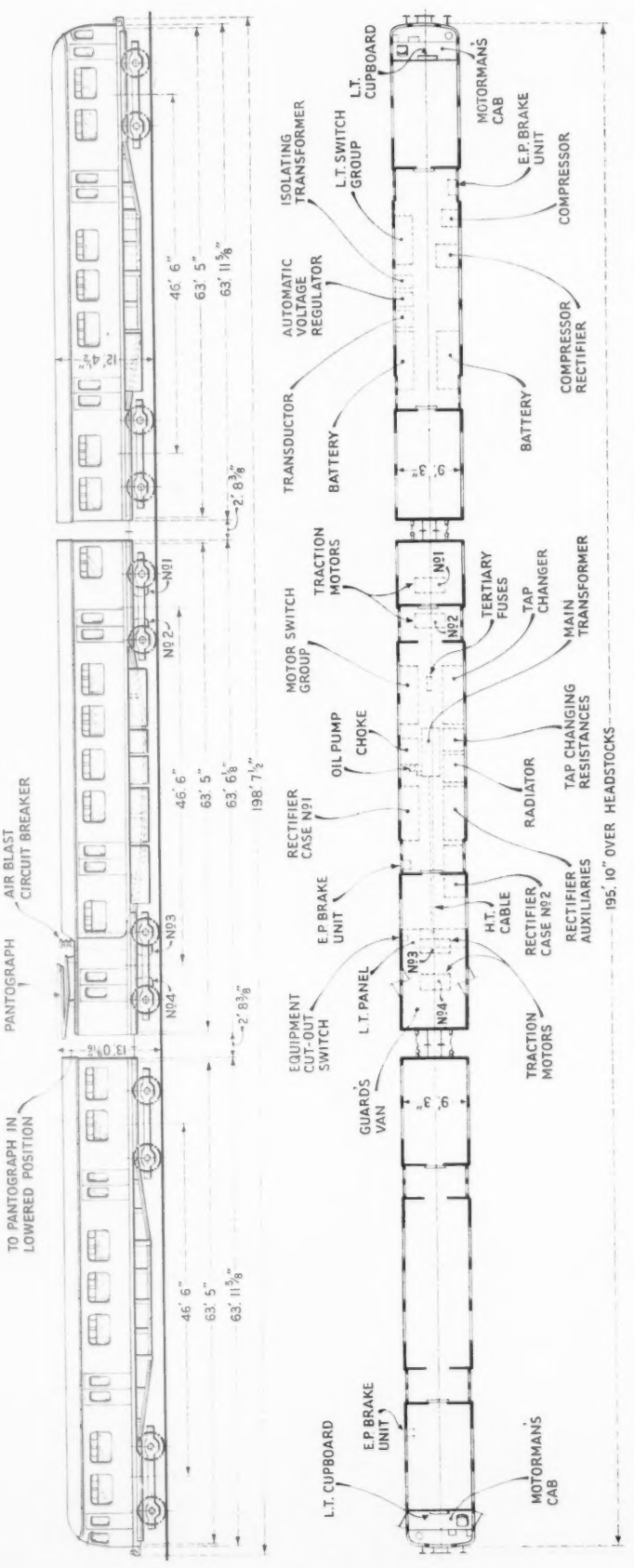


Diagram of three-car set, showing principal dimensions and layout of equipment

nected by a 25-kV. oil-filled aluminium conductor cable with Motherwell Feeder Station. A sub-feeder station will also be located at Cathcart fed by an oil-filled aluminium conductor cable from Eglinton Street Feeder Station.

The system is so designed that it can continue to operate in the event of failure of any one supply point, and the 25-kV. sections of the overhead line equipment are capable of carrying the through power required in this eventuality.

The track is sectioned electrically at the feeder stations and sub-feeder stations; separate feeds are taken to the up and down tracks in each direction. In addition, track sectioning cabins are situated at intervals along the line. There will be 13 track sectioning cabins installed in the scheme.

Solenoid Operated Circuit Breakers

Single-pole single-phase oil circuit breakers controlling the incoming and outgoing supplies at feeder and sub-feeder stations are provided. These are solenoid operated; balanced pilot protection and overload protection is provided on the circuit breakers controlling the power cables, whilst the oil circuit breakers controlling the tracks are equipped with distance impedance protection. The voltage reference for the latter is obtained by V.Ts. on each switchboard.

At each switching station a 415-V. three-phase supply is taken from the Supply Authorities' local network for lighting, heating, and auxiliary purposes, and in most other cases to afford a signalling supply at 650 V. single-phase through a 415/650-V. single-phase transformer.

Because of the vital importance of signalling supplies a 25-kV./650-V. or 6·25-kV./650-V. voltage regulated transformer is installed at stations or cabins where a signalling supply is given to provide an alternative supply in the event of a failure of the main supply. The changeover of supply is automatic in the event of a failure of either supply. The 25-kV./650-V. and 6·25-kV./650-V. transformers are fed through a fuse unit on the appropriate switchboard.

A 110-V. switch-closing battery is installed at each switching station, together with a 50-V. battery for supervisory equipment at all stations and cabins having direct supervisory control.

All stations and cabins will be unattended and will be controlled from an electrical control station located at Cathcart. A mimic diagram located in the control room will display each oil circuit breaker and overhead line motorised switch position, a key enabling each position to be operated and continuously recorded. In addition, alarm indications, meter readings, and telephone facilities are available on a desk in the control room.

Multiple-Unit Rolling Stock

Each three-coach unit is made up of one driving trailer coach, one non-driving motor coach and one battery driving trailer coach; two or three units may be coupled together to form six- or nine-coach trains. The individual

coaches of each unit are not separated in service and are coupled with two air hoses, one control jumper cable and one heating and lighting jumper cable. Units are coupled together by a buckeye coupling, one control jumper cable, and two air hoses.

The coaches are of saloon type and have air-operated sliding passenger doors electrically controlled by push button boxes in any guard's compartment. At the outer end of each unit, on the battery driving trailer and driving trailer coaches, is a driving compartment, and at one end of the motor coach is a guard's compartment.

Traction motors geared to each axle of the motor coach provide the motive power for the unit. Electricity is collected from the overhead equipment by a pantograph mounted on the roof over the guard's compartment and passes through the air blast circuit breaker to the main transformer. The voltage is stepped down and the current passes through the control equipment to the rectifiers which change the alternating current to rectified direct current, which is then fed to the traction motors. The control equipments, which are carried on the underframes of the motor coaches on all the units of a train, can be controlled from any driving compartment.

Supply to Ancillary Equipment

The main transformer gives a 240-V. supply throughout the unit for the battery charger and air compressor on the battery driving trailer and all the heaters. The 110-V. battery is kept automatically charged, and this supplies current for operating the control circuits, lights, brakes, and doors. The air compressor is driven by a 200-V. motor, which supplies compressed air for working doors, brakes, control gear, and the warning horns.

The coaches are heated electrically by heaters mounted under certain seats, the heating being controlled by push buttons in the guard's compartment. The trains are fitted with an electro-pneumatic brake which incorporates the Westinghouse automatic brake. In each driving compartment there is a hand brake wheel which operates the brakes on that vehicle only.

The main characteristics are as follow:

Overall length of three-coach set	198 ft. 7½ in.
Overall width	9 ft. 3 in.
Estimated tare weight	128 tons.
Traction motor voltage	975 V.
1 hr. rating of motors	220 h.p.
Gear ratio	17: 70
Maximum safe speed	75 m.p.h.
Circuit breaker rupturing capacity	300 MVA. at 25 kV.
Level balancing speed full field	60 m.p.h.
Level balancing speed weak field	70 m.p.h.

Colour-Light Signalling

Colour-light signalling is being provided on all running lines to be electrified on both the north and south of the River Clyde to give increased headway for the proposed improved electric train services, and both main lines will be track circuited throughout. The new signalling circuits are designed to overcome any magnetic or inductive effect from traction or stray circuits.

On the north of the river section the existing 56 signalboxes will be reduced to 27 which includes two new power-operated boxes of the route relay interlocking type at Hyndland and Dumbarton, and at the remaining boxes the existing mechanical lever frames are being retained with the addition of switch panels for controlling the main line signals.

On the south of the river section the existing 21 boxes will be reduced to seven, of which three will be new structures comprising two power-operated boxes at Glasgow Central and Cathcart, and a mechanically operated box with signal switch panel at Muirhouse Junction.

The section of line on the north side between Westerton and Dalmuir Park including the Milngavie Branch covering about nine route miles has already been completed and work is now in progress on the remainder of the scheme. The introduction of British Railways automatic warning control in conjunction with the new colour-light signals is also planned.

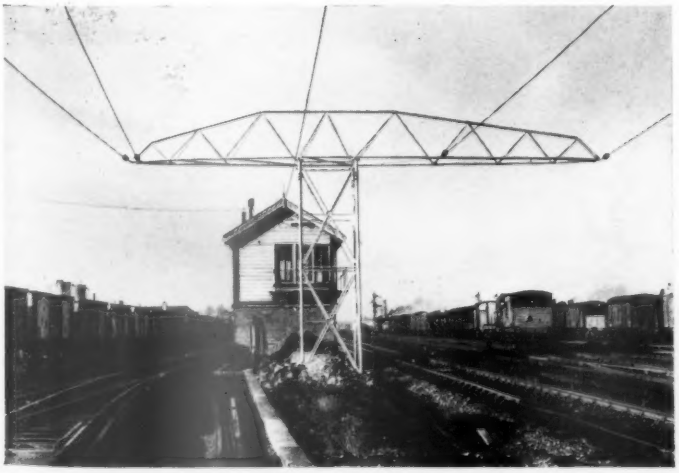
The overhead line equipment between Westerton and Milngavie has, subsequent to satisfactory tests, been energised at 6·25 kV.; likewise the overhead line equipment from the neutral section at Westerton Sub-Feeder Station to Singer Workers' platforms has, subsequent to satisfactory tests, been energised at 25 kV. It is expected that an electric service will be introduced on the north side of the Clyde during the summer of 1960, and on the south side during the summer of 1961.

The principal sub-contractors are as follow:—

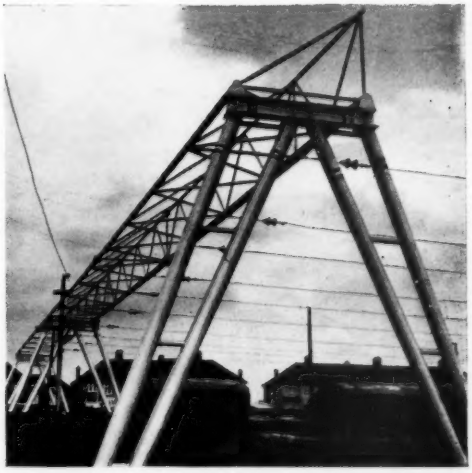
Overhead equipment survey work	British Insulated Callender's Construction Co. Ltd.
Erection of overhead line equipment	Pirelli - General Cable Works Limited.
25-kV. gas-filled distribution cable	W. T. Glover & Co. Ltd.
6·25-kV. feeder cable and and 1,100-V. pilot cable	Scottish Cables Limited.
25-kV. and 6·25-kV. switchgear	Switchgear & Cowans Limited.
Electrical equipment for three - car multiple - unit stock	Metropolitan - Vickers Electric Co. Ltd.
Supervisory remote control equipment	Automatic Telephone & Electric Co. Ltd.
Bodies for three - car multiple-unit stock	Pressed Steel Co. Ltd.
Batteries and battery chargers	Tungstone Products Limited
Oil-filled distribution cable, 1,100-V. pilot cable, and cable route materials	W. T. Henley's Telegraph Works Co. Ltd.
Concrete cable troughing ...	Springbank Quarry Co. Ltd.
Voltage regulators... ...	Brentford Transformers Limited.
Power distribution and voltage transformers	Foster Transformers Limited.
Overhead isolators and switchgear	Bertram Thomas (Engineers) Limited. / Switchgear & Equipment Limited.
Booster transformers ...	Fuller Electric Limited.
25/6·25-kV. power distribution transformers	Hackbridge & Hewittic Electric Co. Ltd.
Signalling equipment ...	Metropolitan - Vickers G.R.S. Limited. / Siemens & General Electric Railway Signal Co. Ltd. / Westinghouse Brake & Signal Co. Ltd.

Overhead Electrification of Sidings in the Southern Region

(*See page* 460 *of our November* 20 *issue*)



Special cantilever arm assembly at Hither Green up sidings

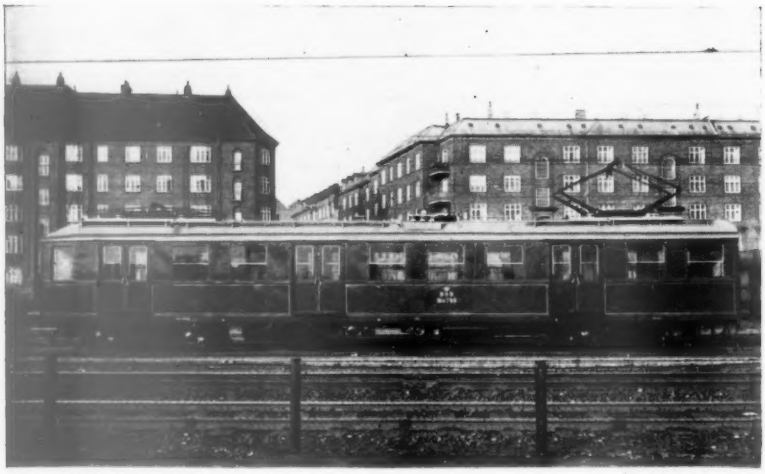


Contact wire terminal gantry in up sidings

Development of Copenhagen Suburban Electrified System

Serving a rapidly expanding urban area

(*By a correspondent*)



Suburban electric motorcoach with all axles motored

THE electric train service on the suburban lines round Copenhagen was inaugurated in 1934 on the lines Frederiksberg - Vanløse - Hellerup and Copenhagen Central-Hellerup-Klampenborg. In 1936 an electric train service was introduced between Copenhagen Central and Holte. In 1949 the Copenhagen Central-Vanløse-Ballerup was electrified. The latest extension of the electrified system, from Copenhagen Central to Valby and Glostrup, was opened in 1953.

The present network comprises about 37 miles of line with 37 stations. The average distance between stations is 1 mile, larger in the suburbs and smaller in the centre of the city. All the lines are double except the two short stretches Herlev-Ballerup and Hvidovre-Glostrup.

The electrified network is served by trains as follows: line A, Klampenborg-Copenhagen Central-Vanløse; line B, Holte-Copenhagen Central-Glostrup; line C, Ballerup-Copenhagen Central-Hellerup; line F, Frederiksberg-Vanløse-Hellerup.

Trains are run at 20-min. intervals on all four lines throughout the day. In peak hours line A trains are extended from Vanløse to Herlev, so providing a 10-min. service on part of the Ballerup line. Line C trains in peak hours are extended from Hellerup to Holte, and further relief trains are run between Copenhagen Central and Lyngby, providing a 6⅔-min. service (on average) on most of the Holte line. The line F service is extended from Hellerup to Klampenborg, so that there is a 10-min. service on the Klampenborg line during peak periods. A 10-min. service will shortly be provided during traffic peaks to Hvidovre by extending the Lyngby-Copenhagen Central trains.

The section between Hellerup and Valby is served by line A, B, and C trains, and has, therefore, three trains every 20 min. throughout the day, and in peak hours four trains every 20 min. During the summer there is heavy traffic to the holiday resort of Klampenborg, so during this period line F trains are extended from Hellerup to Klampenborg. The same applies to line C.

Make-up of Trains

The trains are made up of two, four, six or eight cars. On line F the length of the platforms only allows six-car trains, while the other lines can all accommodate eight-car trains.

The electric power is supplied partly by the City of Copenhagen power station, and partly from the North Zealand Electricity & Tramway Co. Ltd. It is delivered as 30,000; 10,000 or 6,000V a.c. and transformed in eight rectifier sub-stations and distributed to the overhead line at 1,650V d.c.

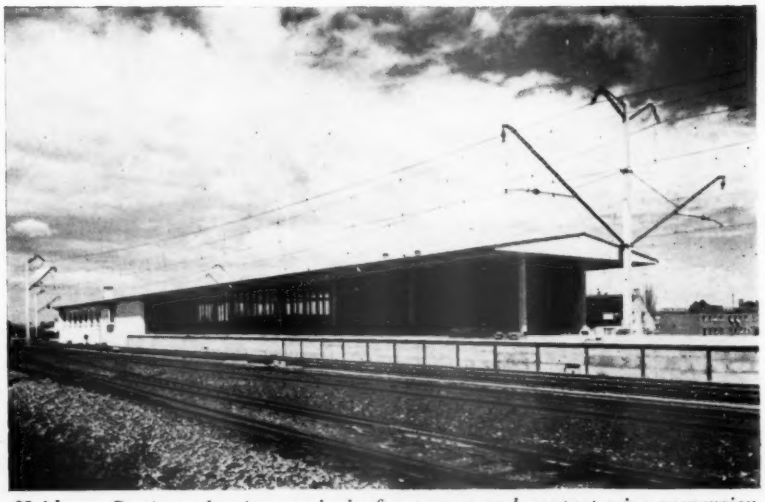
The sub-stations are placed with a view to future extensions of the network. All sub-stations are remote controlled from the main sub-station at Enghave. All the rectifiers are of the mercury-arc type. Overhead current collection is used.

The rolling stock consists of 102 motor coaches and 102 trailers. The motor coaches have two bogies with two traction motors on each. The one-hour rating for these motors is 120-132kW. The seating capacity is 66 and the weight is 45 *tonnes*. To a motor coach may be coupled an ordinary trailer or a trailer with a driving compartment. The ordinary trailers have 78 seats and weigh 34·8 *tonnes*. Newer cars are of welded design and therefore somewhat lighter. The driving trailers have 60-83 seats and a weight of about 26·3 *tonnes*. All cars have electric heating and pneumatically controlled sliding doors.

The driving trailers are used in two-car train units composed of one motorcoach and one driving trailer. The ordinary trailers are used in four-car train units made up of two motorcoaches and two trailers.

Structure of Fares

The fares on the suburban electrified lines as well as on other local lines are with a few exceptions charged on the same basis as those for all other sections of the Danish State Railways. On the urban lines however (the part of the system within the cities of Copenhagen and Frederiksberg) the fare is fixed by agree-

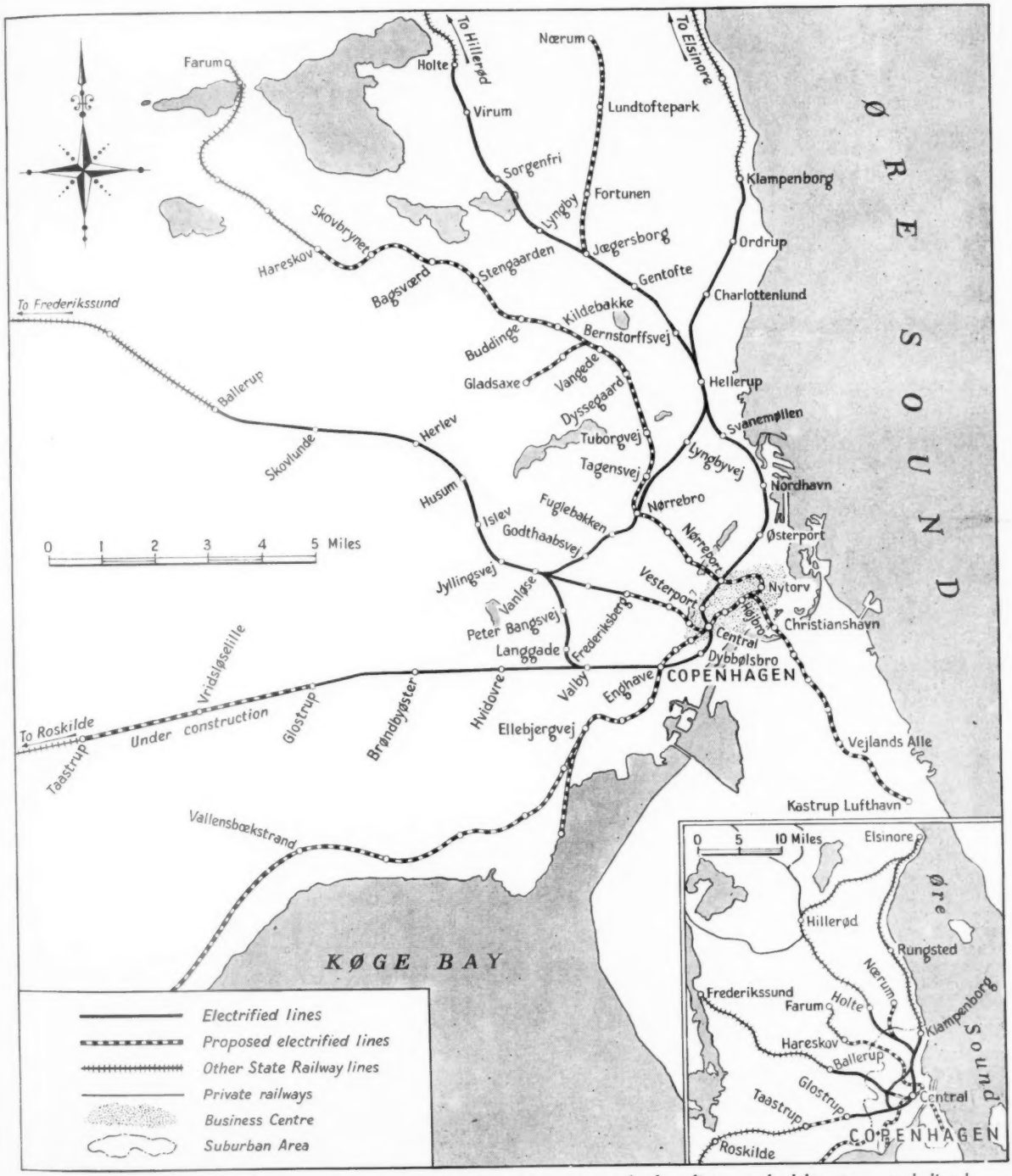


Hvidovre Station, showing method of catenary and contact wire suspension

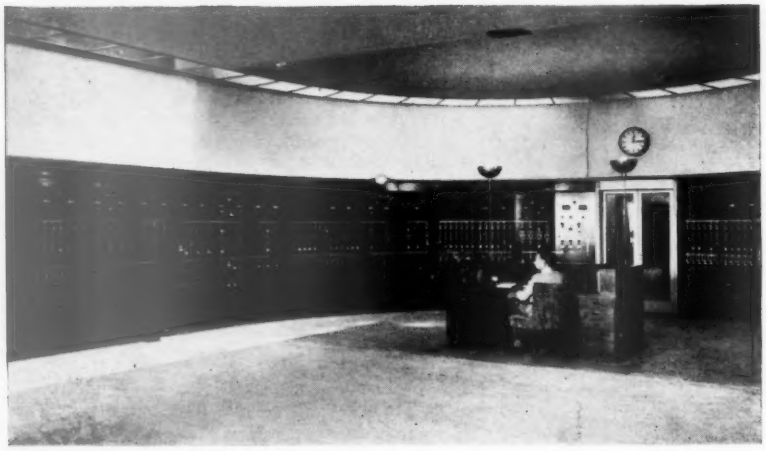
ment with the Copenhagen Tramways and at present stands at a flat rate of 55 ϕre per single uninterrupted journey. (1 krone or 100 ϕre = approx. 1s.) A card with four such tickets may be bought for 2 kroner. There is also a transfer ticket (available for an unlimited number of transfers within one hour), which costs 65 ϕre, and a transfer ticket available for combined travelling by the urban railway and the Copenhagen Tramways during a period not exceeding one hr. The price of this transfer ticket is 80 ϕre. The price of a monthly season ticket on the urban line is 20·10 kroner.

Growth of Traffic

Traffic, although increasing in total, shows the same tendency as in London. The peak-hour traffic is increasing rapidly, while that at other hours remains constant, so that the peak traffic forms an increasing part of the day's working. The traffic between 8 and 9 a.m. now constitutes 26 per cent of the day's total traffic in one direction. Of the stations in the suburbs Lyngby Station is by far the largest, being the centre in a considerable population, and a large number of bus routes having their terminus there. Of the city stations Nørreport is the largest.



Railways in the Copenhagen suburban area, showing, inset, outer suburban lines worked by steam and diesel



Control room in the main substation at Enghave, from which the other seven substations are remotely controlled

The number of journeys on the electrified network has been steadily increasing, as may be seen from the following table:—

Number of Journeys in Millions

	Urban lines (Kobenhavns Bybane)			Electrified suburban lines			Other local lines		
	Ordinary tickets	Season tickets*	Total	Ordinary tickets	Season tickets*	Total	Ordinary tickets	Season tickets*	Total
1938/39	4·1	2·0	6·1	10·2	7·6	17·8	4·7	4·2	8·9
1945/46	13·0	2·6	15·6	13·1	11·0	24·1	5·3	4·3	9·6
1948/49	13·5	3·0	16·5	14·2	11·3	25·5	7·7	6·0	13·7
1951/52	14·2	5·3	19·5	14·4	14·9	29·3	5·8	6·4	12·2
1954/55	16·8	7·6	24·4	14·7	21·2	35·9	5·0	9·1	14·1
1957/58	14·5	10·0	24·5	15·4	22·2	37·6	4·6	9·3	13·9

* From 1954/55 the figures comprise one-week season tickets

The profitability of the electrified suburban service is not easy to assess, because the electric trains on two of the lines use the tracks in common with other trains, and because some of the equipment used by the electric services was erected many years ago for steam trains. A calculation for the year ended March 31, 1959, shows gross receipts of 38·4 million against working expenses of 33·5 million kroner. This leaves a working surplus of 4·9 million to cover interest and depreciation, which is estimated to amount to 7·8 million kroner.

Season Ticket Traffic

The electrified lines do not convey all the Copenhagen suburban traffic to Copenhagen. There is also, as shown in the above table, season-ticket traffic on the lines to Rungsted, Elsinore and Hillerød, on which there is a half-hourly service in peak hours by steam or diesel trains; on the main Western line to Roskilde with numerous trains; and to Frederikssund. Also there is commuter traffic on the single track Hareskov line between Copenhagen L Station and Farum. This line was originally privately owned, but was taken over by the State Railways in 1948. It still has its terminus several miles from the centre of the city, and passengers have to change to trams to reach the business centre.

The population of Copenhagen including the suburbs today is over 1·3 million, and it is increasing at the rate of 15–20,000 a year. In the city itself space is exhausted, and since 1950 the population, has been decreasing. The suburbs are spreading rapidly. Co-ordination has taken place between the Regional Town Planning Committee and the State Railways as to the placing of new suburbs and to the service of the Region by new railways.

At the same time the State Railways has discussed plans for future underground railways with the City authorities, and agreement has been reached between the technical departments.

There are several plans for future suburban and urban electric railways. A new railway is planned from Jaegersborg to Naerum to serve new residential and industrial areas, and the Hareskov line is to be doubled and electrified and then carried in a new tunnel from its present terminus at Nørrebro to the centre of the city. From Nørreport the tunnel runs in a curve passing Kongens Nytorv, Højbro and the Town Hall Square to Copenhagen Central, and from there further out towards the South West along Køgebugt. Through the city the line will run in a 5·4-mile tunnel, while further out the railway will for the most part be raised, so eliminating level crossings.

The necessary land for the projected Køgebugt line has to a large extent already been acquired. Along this line there is considerable scope for housing development but this is being withheld, until railway construction starts. To reduce the size of the tunnel it is the intention to use the third rail system on this line.

Hareskov Line Branch

There are also plans for a short branch off the Hareskov line from Vangede to Gladsaxe, serving new housing and industrial areas there. The line to Glostrup is being extended to Taastrup, a distance of four miles. This line will be ready in 1962.

Further plans are to carry the Ballerup line not via Valby as at present, but via Frederiksberg in a new tunnel, through the centre of the city toward the Southern part Sundby and eventually to the airport at Kastrup. This tunnel would be 6.7 miles long. Through the centre of the city from Copenhagen Central to Hojbro the line uses the same tunnel as the Hareskov—Kogebugt line.

The State Railways is now preparing a law for the building of the lines to Naerum, Hareskov and Kogebugt, and if this is passed in Parliament, work will be started shortly.

Østerport substation, showing two rectifiers and provision for a third

RAILWAY NEWS SECTION

PERSONAL

Mr. A. I. Emerson, Assistant (Permanent Way), Chief Civil Engineer's Office, York, North Eastern Region, British Railways, has been appointed District Engineer, Cambridge, Eastern Region.

Mr. A. H. Chilton, M.I.E.E., M.I.Mech.E., M.I.Loco.E., retires from J. Stone & Co. (Holdings) Ltd., on December 31. Mr. Chilton received his early training with the Electric Construction Co. Ltd., and Wolverhampton Corporation Electricity Department. In 1913, he was appointed Assistant Electrical Engineer to the G.I.P. Railway, Bombay, and later resigned from this position to take an appointment with Metropolitan-Vickers Limited, Bombay, as Joint Manager. In 1927, Mr. Chilton rejoined the Indian Railways as Chief Electrical Engineer, East Indian Railway and later, became Chief Electrical Engineer, North Western Railway. In 1931 he returned to England and was appointed Chief Electrical Engineer of J. Stone & Co. Ltd., becoming a Director of that company in 1946, on its reorganisation as a public company. In 1950, J. Stone & Co. Ltd., became J. Stone & Co. (Holdings) Ltd., and Mr. Chilton retained his seat on the board and was appointed Chairman of the operating company, J. Stone & Co. (Deptford) Ltd., which position he retained until 1956, continuing to serve the holdings company from that date until now. On his retirement from J. Stone & Co. (Holdings) Ltd., he is taking up an appointment on the board of Carlyle Air Conditioning & Refrigeration Limited, as an Alternate Director. He will act as adviser and consultant to the company.

Mr. A. H. Chilton

Director, J. Stone & Co. (Holdings) Ltd., who is retiring

We regret to record the death, on December 6, after a long illness, of Mr. R. F. Harvey, M.B.E., M.I.Mech.E., M.I.Loco.E., Chief Operating & Motive Power Officer, British Railways, Central Staff, 1955-57. Mr. Harvey was born at Louth, Lincs, in 1893, and educated at Watford and Derby Technical College. He joined the Midland Railway in 1908 at Derby Locomotive Works, and became Assistant to the District Locomotive Superintendents at Leeds and Kentish Town in 1914 and 1915 respectively. After service in the Royal Navy from 1915 to 1919 he returned to Kentish Town as Assistant District Locomotive Superintendent. He was appointed District Locomotive Superintendent at Worcester in 1922, at Burton-on-Trent in 1923, at Rugby in 1927, and at Liverpool, Edge Hill, in 1932. In January, 1934, he became Assistant Divisional Superintendent of Motive Power at Manchester, and in October, Assistant to the Superintendent of Motive Power, L.M.S.R., Euston. He was transferred to Glasgow as Assistant Operating Manager (Scotland) in 1939 and became Motive Power Superintendent, Scottish Region of British Railways, in 1948. For services rendered during the war he was made an M.B.E. in 1943. Mr. Harvey became Chief Officer (Motive Power), Railway Executive, in 1950 and was appointed Chief Operating & Motive Power Officer, British Railways Central Staff on January 1, 1955. He retired from this position in January 1958 for reasons of ill health. A cremation service was held at Golders Green Crematorium on December 8.

The late Mr. R. F. Harvey

Chief Operating & Motive Power Officer, B.R. Central Staff, 1955-58

Mr. J. F. Wood, Chief Engineer, Eastern Counties Omnibus Co. Ltd., has been appointed General Manager, United Welsh Services Limited.

Mr. A. J. Webster has been appointed a Director of the London Aluminium Co. Ltd.

Mr. Ernest Partridge, has been appointed Parliamentary Private Secretary to the Joint Parliamentary Secretary to the Minister of Transport.

Mr. William Sidwell, District Motive Power Superintendent, Worcester, Western Region, British Railways, has been appointed Running & Maintenance Officer, Divisional Traffic Manager's Office, London.

Mr. Donald Cameron of Lochiel, a nominee of the British Transport Commission, has been appointed a member of the Transport Users' Consultative Committee for Scotland until April 30, 1960, in place of Sir Ian Bolton, who has retired from the Commission.

Mr. E. G. Boyd, Sales Engineer for Latin-America, W. H. Dorman & Co. Ltd., left London by air on December 9 for a six months' tour of his territory. Mr. H. B. McAuslan, Sales Engineer for the Far East, also left London by air on December 7, for a six months' tour of his territory.

XUM

Dipl.-Ing. Gotthold Reschuh, General Manager, Railway Signalling Works, Braunschweig, Siemens & Halske A.G., has been nominated an Honorary Senator of the Technische Hochschule in that city, in recognition of his notable services to the advancement of railway signal engineering. Ing. Reschuh, who is 60, has been many years in the service of Siemens & Halske A.G.

Mr. C. E. Mahmud, Chief Traffic Manager, Eastern Bengal Railway, Pakistan, who, as recorded earlier this year, has been appointed Director of Traffic, Ministry of Railways & Communications, Railway Division, Karachi, was born in 1907. After graduating from Muslim University, Aligarh, in 1927, he went to England for training on the railways. On his return to India, he joined the Madras & Southern Mahratta Railway as Assistant Transportation Superintendent (Traffic). In 1947 he was promoted to be Divisional Transportation Superintendent. On partition, Mr. Mahmud moved to the Eastern Bengal Railway, as Divisional Personnel Officer. The same year he was transferred to the Railway Division, Karachi, as Deputy Director (Establishment). In 1950 he became Joint Director (Establishment). He was transferred to the North Western Railway, in 1953, as Deputy Chief Operating Superintendent and later was appointed Divisional Superintendent, Lahore and Multan.

Mr. G. M. Ingram has been appointed Branch Manager, Manchester Office, Brush Electrical Engineering Co., Ltd. He was previously Branch Manager, Sheffield. Mr. R. Atkins, Sales Engineer, Birmingham, becomes Branch Manager, Sheffield.

Mr. John Cooke has been appointed Director, Export, A.E.C. (Sales) Limited following the retirement of Mr. J. M. E. Fell.

Mr. Cecil F. Tracy has joined the Pressed Steel Company as a Divisional Director, Prestcold Division. He will be Production Director of the new Swansea plant.

Mr. J. O. Knowles, a Director of Metal Industries Limited, has been elected Chairman of the British National Committee of the International Electrotechnical Commission. He succeeds Colonel B. H. Leeson, who has resigned.

Mr. Cyril Bayton, Chief Mechanical Engineer of Taylor Woodrow Construction Limited, has been appointed to the Board of Taylor Woodrow Plant Co. Ltd. Mr. Jack Rogers has been appointed to the board of Taylor Woodrow Services Limited.

Mr. D. N. Steeley has been appointed Sales Manager of Standard Industrial Motors, G.E.C. Engineering Works, Birmingham. He was an Assistant Branch Engineer, London.

Mr. C. M. Williams, Secretary, Rhondda Transport Co. Ltd., has been appointed, as from a date to be agreed, Secretary-Accountant of the Devon General Omnibus & Touring Co. Ltd. He will succeed Mr. W. H. Geere, who will be retiring in a few months, after more than 40 years' service with The National Electric Construction Co. Ltd., and the Devon General Co. Ltd. Mr. Geere was appointed Assistant General Manager of the Devon General Omnibus Co. Ltd. in 1938, and, additionally Secretary-Accountant in 1952.

Mr. T. B. Ellis has been appointed Secretary, General Electric Co. Ltd. He succeeds Mr. T. B. O. Kerr, who has been appointed Director of Finance & Administration.

Mr. Leslie B. Farmiloe, of T. & W. Farmiloe Limited, has been appointed President of the National Paint Federation. Mr. Stanley W. Greig, of British Paints Limited, has been appointed Vice-President.

Mr. M. A. Rao, C.E.(Hons.), M.I.E.(India), A.M.A.S., Senior Deputy General Manager, Eastern Railway of India, who, as recorded earlier this year has been appointed Principal of the Railway Staff College, Baroda was born in 1909, at Jodhpur in Rajasthan. Mr. Rao graduated with honours in Civil Engineering from Roorkee University. He joined the Jodhpur Railway as an Assistant Engineer in 1931, and became Executive Engineer in 1942. In that capacity he was responsible for the survey and construction of 86 miles of railways. He was also responsible for the survey, design, construction, and running of the metre-gauge wagon assembly plant at Hyderabad. Mr. Rao was promoted to be Chief Engineer in 1948, and in the same year he was appointed General Manager of that system. In April, 1952, when Jodhpur Railway became part of the then newly-formed Northern Railway, he was appointed Divisional Superintendent, Jodphur. During 1953-54 he served as Administrative Officer, Kumbh Mela. He became Senior Deputy General Manager of the Central Railway, in 1958, and of the Eastern Railway later that year. In 1951, Mr. Rao represented the Railway Board at the Fourth International Congress on Large Dams.

Mr. C. E. Mahmud

Appointed Director of Traffic, Ministry of Railways & Communications, Karachi

Mr. M. A. Rao

Appointed Principal, Railway Staff College, Baroda, India

Mr. Henry Ernst

Manager, London, Swiss National Tourist Office & Swiss Federal Railways, 1946-59

The late Mr. E. Stephenson

Works Manager, Shildon Wagon Works, L.N.E.R., 1923–34

Mr. M. Harbottle

Appointed District Engineer, Derby South, L.M. Region

Mr. Henry Ernst, Manager, London, Swiss National Tourist Office & Swiss Federal Railways, who is retiring on December 31, joined the Swiss Federal Railways in 1912 at the age of 18, after graduating from the Railway Section of the Technical Training College at Winterthur. After service at various stations in Switzerland, including two years at Geneva, partly as Liaison Officer between the International Red Cross and the railways during the war of 1914-18, he was transferred in 1919 to the London Office of the Swiss Federal Railways. He was promoted to be Chief Clerk in 1935 and Assistant Manager in 1946. Later that year he was appointed Manager, London Office, Swiss Federal Railways & Swiss State Travel Bureau.

Mr. Robert Graham, Yardmaster, High Street & College, Glasgow, Scottish Region, British Railways, has been appointed Stationmaster, Cowlairs.

Mr. A. Barton has been appointed Works Manager, Opperman Gears Limited.

Mr. Clifford J. Hudson, a representative of Small & Parkes Limited, has retired after more than 32 years' service.

Mr. G. K. M. Dickinson, London Manager, Ransomes Sims & Jefferies Limited, has retired after 50 years of service with the company.

Mr. R. E. Burnett, General Manager, Marconi Instruments Limited, has been elected to the board, and appointed Managing Director.

Mr. R. W. Brocklehurst, a Director of the English Steel Forge & Engineering Corporation Limited has been appointed General Superintendent.

Mr. G. B. R. Feilden, Managing Director of Hawker Siddeley Brush Turbine Limited, and Chairman of National Free Piston Power Limited has been appointed to the board of Hawker Siddeley Industries Limited.

Mr. Michael Farr has been appointed Chief Information Officer, Council of Industrial Design. He will succeed Mr. Noel White, who becomes Deputy Director on January 1.

The late Mr. E. Stephenson, Works Manager Shildon Wagon Works, London & North Eastern Railway, 1923-34, whose death, at the age of 90, was briefly recorded in our December 4 issue, had completed more than 52 years of railway service at the time of his retirement. He began his career as an apprentice in the York Works of the former North Eastern Railway, at the age of 12½, when he served in the drawing office. He subsequently joined the Outside Machinery Department, before moving to the drawing office of the Carriage & Wagon Works, where later he became Chief Draughtsman. About 1911, Mr. Stephenon joined the late Sir Vincent Ravens' staff at Darlington, and during the 1914-18 war was with Sir Vincent Raven at the Admiralty. Some time later he was appointed Assistant Works Manager Carriage & Wagon Works, York. In 1923, he became Works Manager Shildon, a position he held until his retirement in 1934. Mr. Stephenson's family has served on the railway continuously since 1851. His father was Locomotive Superintendent at York, his four brothers also served on the railway, and his nephew is now the District Carriage & Wagon Foreman, at Aberdeen, Scottish Region, British Railways.

Mr. Lionel Harper, a Director of Massey-Ferguson Holdings Limited, has been appointed Assistant Managing Director of Massey-Ferguson (United Kingdom) Limited.

Mr. T. Jackson has been appointed Assistant to Commercial Officer (Coal), York, North Eastern Region, British Railways. Mr. Jackson joined the London & North Eastern Railway, in 1925, as a clerk in the Divisional General Manager's Office at York. After experience at various stations he was appointed a traffic apprentice in 1932. After three years' training in the Southern Area of the L.N.E.R. he took up an appointment in the Passenger Manager's Office, Liverpool Street. In 1951 he became Assistant to the District Passenger Superintendent, Liverpool Street, and, later the same year, Assistant to District Commercial Superintendent, Shrewsbury, Western Region. He moved to the North Eastern Region, in 1953, as Assistant District Passenger Superintendent, Newcastle, and in 1955 was appointed Assistant District Commercial Superintendent (Sales), Middlesbrough, the position he now vacates.

Mr. M. Harbottle, D.S.O., O.B.E., A.M.I.C.E., District Engineer, Inverness, Scottish Region, British Railways, who, as recorded in our November 6 issue, has been appointed District Engineer, Derby South, London Midland Region, joined the London Midland & Scottish Railway in 1926 as an apprentice engineer. In 1930, he became Junior Assistant, New Works Department, in the Divisional Engineer's Office, Glasgow, and, in 1934, Resident Engineer on the Ayr Harbour South Pier Reconstruction. In 1937 he was appointed Canal Assistant to the District Engineer, Chester, in charge of the Shropshire Union Canal. Transferred to Liverpool, in 1943, as Works Assistant to the District Engineer, he returned to Scotland in 1945, on appointment as Assistant District Engineer, Inverness. In 1946 he was appointed Assistant District Engineer, Perth, and in January, 1958, he became District Engineer, Inverness. Mr. Harbottle was a founder member of the L.M.S. Permanent Way Educational Staff Panel and an Instructor for many years. He was Honorary Secretary of the Glasgow Association of Students of the Institution of Civil Engineers from 1933-1937.

Mr. R. W. Evans, Mr. R. H. M. Kindersley and Mr. I. S. Scott-Maxwell have been appointed Directors of the Steel Company of Wales Limited.

Mr. B. S. Prichard has relinquished his office as Managing Director of Patent Shaft Steel Works Limited. He will in future be Director responsible for sales and commercial development. Mr. Bryan Bruce-Gardner, a Director of the company, has been appointed General Manager.

Mr. and Mrs. F. B. Coales, Directors of Winn & Coales Limited, left London on December 16 on a business trip to Australia and the Pacific. Their tour will include New Zealand, the western American shores, Japan, Hong Kong and the Indian Ocean. They return to London on April 16.

Sir Leslie Rowan, a Director of Vickers Limited, has been appointed Chairman of Robert Boby Limited, a subsidiary of Vickers. He succeeds Mr. A. H. Hird, who has resigned as Chairman and as a Director of that company because of the extent of his other commitments within the Vickers group.

XUM

Mr. R. B. Temple

Traffic Manager, Sheffield, Eastern Region, 1957–59

Mr. E. R. Williams

Appointed Traffic Manager, Sheffield, Eastern Region

Mr. G. W. Miller

Appointed District Motive Power Superintendent, Derby, L.M. Region

Mr. R. B. Temple, Traffic Manager, Sheffield, Eastern Region, British Railways, who, as recorded in our November 13 issue, retires on December 31, joined the North Eastern Railway in 1911. After experience at various stations, he was appointed to a position in the General Manager's Office, York, in 1920. He became Stationmaster at Pickering, in 1928, at Hatfield, in 1931, and at Southend (Victoria) later the same year. Mr. Temple returned to York in 1933 as Head of the Canvassing & Development Section of the Goods Manager's Office, and in March, 1939, was appointed Assistant District Goods Manager, Leeds. From September, 1939, Mr. Temple was Acting District Goods Manager, Leeds, until he moved to Lincoln, as District Goods & Passenger Manager, in 1943. He was appointed District Goods Manager, Leeds, in April, 1946, and District Goods Manager, Sheffield, in June, 1947. This appointment was re-designated District Goods Superintendent, Sheffield, in July, 1950, and reverted to the title of District Goods Manager, Sheffield, in January, 1955. He became Traffic Manager, Sheffield, in 1957. Mr. Temple is a member of the Sheffield Chamber of Commerce Council and a Director of the East Midland Motor Services Limited, and the Yorkshire Traction Co. Ltd.

Mr. J. S. Ward has been appointed Sales Manager, Air Impeller Department, S. Smith & Sons (England) Limited.

Mr. C. J. Calderwood and Mr. H. H. Higginson have been appointed Joint Managing Directors of the Spurling group of companies. Mr. W. F. Spurling has resigned as Managing Director in order to make way for younger men, but will, for the time being remain Chairman.

Lord Plowden joins the board of Tube Investments Limited on January 1, and will become a Vice-President. He will also replace Sir Ivan A. R. Stedeford as Chairman of the British Aluminium Co. Ltd. Lord Reith is retiring from the board of Tube Investments Limited. Two members of the board of that company, Mr. Walter Hacket, Jr., and Mr. R. D. Young have been appointed Assistant Managing Directors. Sir David Watherston has been appointed Director of Personnel, Tube Investments Limited. A newly created appointment.

Mr. E. R. Williams, M.B.E., M.Inst.T., District Commercial Officer, Sheffield, Eastern Region, British Railways, who, as recorded in our November 13 issue, has been appointed Traffic Manager, Sheffield, joined the London & North Eastern Railway, as a traffic apprentice, in 1934, from Oxford University, where he took an Honours Degree in Modern Languages. He became a relief stationmaster in 1937 and Assistant to the District Manager, Peterborough, in 1938. During the 1939-45 war, he served in the Royal Engineers (Movement & Transportation) in France, North Africa, Italy, Austria, and at the War Office, attaining the rank of Lt.-Colonel. He was awarded the M.B.E. and the Emergency Reserve Decoration. Since the war, Mr. Williams has held appointments as Goods Agent, Chelmsford; Assistant to the District Operating Superintendent, Stratford, and Assistant General Agent for British Railways in France. He moved to Sheffield, in 1953, as District Passenger Superintendent. He has been District Commerical Officer, Sheffield, since 1957. Mr. Williams has, this year, been Chairman of the Sheffield & District Section, Institute of Transport, and has served as a member of Council of the Sheffield Rotary and Skal Clubs. He is a member of the Sheffield Chamber of Commerce, of the Sheffield Joint Omnibus Committee and also has served on the Standing Joint Committees of the Yorkshire Traction Co. Ltd., and East Midland Motor Services Limited.

Mr. L. J. Thomas has been appointed Managing Director of Waddells (Stratford Steel Equipment) Limited. Mr. W. G. F. Westbrooke has been appointed Managing Director of Expert Heat Treatments. Both companies are subsidiaries of Expert Tool & Case Hardening Co. Ltd.

The following appointments are announced by Philips Electrical Limited; Mr. I. F. Davies to be an Executive Engineer, Lamp & Lighting Group. He has joined the company from the Research Laboratories of the General Electric Co. Ltd. Mr. M. G. A. Jackson becomes Manager, Lighting Design Service Department; Mr. W. G. Whitaker is to be Senior Lighting Engineer in the company's South East Region ; Mr. R. H. Chambers has been appointed Regional Lighting Engineer, Midlands Region.

Mr. G. W. Miller, District Motive Power Superintendent Bescot, London Midland Region, British Railways, who, as recorded in our November 6 issue, has been appointed District Motive Superintendent, Derby, was educated at King Edward VII School, Lytham, and served his apprenticeship at Horwich Locomotive Works from 1923 to 1928. He became Running Shed Foreman, at Stourton in 1932 ; Chairman of Locomotive Operations Analysis Committee, Crewe, in 1934, and Running Shed Foreman, Preston, in 1935. Mr. Miller subsequently became Assistant District Locomotive Superintendent at Bank Hall, in 1936 and at Crewe in 1942. He was appointed District Motive Power Superintendent at Skipton in 1947 and moved to Bescot in the same capacity in 1951.

Mr. F. J. Slee, Joint Lubricants Manager, Shell-Mex & B.P. Limited has retired. Mr. L. H. Coney, Joint Manager, Lubricants Department, is now the Manager.

Mr. A. J. Young, General Manager, English Electric Valve Co. Ltd., has been elected to the board and appointed Managing Director. Mr. F. N. Sutherland has also joined the board.

L.M.R. Appointments

London Midland Region, British Railways, announces the following appointments:—

Mr. E. W. Hill, as Assistant District Passenger Manager, Manchester.

Mr. R. D. Lattimer, as Assistant (Modernisation), Director of Traffic Services, Euston, (Located Euston).

Mr. R. R. Butter, as Assistant (Modernisation), Director of Traffic Services, Euston, (Located Birmingham).

Mr. B. Wood, as Assistant (Budgetary Control & Progress), Chief Civil Engineer's Department, Euston.

Mr. J. Thorpe, as Chief Technical Assistant (C. & W.), Derby.

Mr. F. Warburton, as Assistant Outdoor Machinery Engineer, Chief Mechanical & Electrical Engineer's Department, Derby.

Mr. E. T. Allsop, as Senior Investigator, Regional Accountant's Department, Euston.

Mr. S. H. Walton, as Goods Agent, Manchester (London Road), also in charge of Ducie Street.

Mr. E. Oliveand, as Goods Agent, Ancoats-Ardwick.

NEW EQUIPMENT AND PROCESSES

Spraying with Heavily-Pigmented material

THE Bullows "Pogo" pump has been developed to meet a problem frequently met with in spray finishing, that of feeding to the spray gun a material which is heavily pigmented, and which readily settles out when not being used.

The pump feeds the material through a standard fluid hose to the spray gun, to which is attached a "Y" piece. From this a second length of hose provides a return flow to the pump and hence to the container of material, which is itself kept agitated by this constant flow and return of material. This very simple arrangement has now been operating for just over 18 months, running day and night, and it is possible to pick up the gun and spray filler at any time, without any stoppage at all.

The pump will operate from a mixing or storage tank, or can be mounted on the existing pressure feed container.

The equipment operates off a normal air line, using less than 3 cu. ft. per min. of air at pressures as low as 30 lb. per sq. in. Cost of the pump is £66 net, excluding hoses, connectors, and "Y" piece.

Further details can be obtained from the manufacturer, Alfred Bullows & Sons Ltd., Long Street, Walsall, Staffs.

Miscible Controls for Railcars

RAILCARS with Rolls-Royce engines, torque converters, and controls can be coupled to existing railcar stock equipped with engines of a different power driving through fluid couplings and gearboxes or other transmissions. In a recent instance, a miscible control system for the new cars was developed which involved no modifications to the existing cars or more wires along the train than those already in use.

The new cars had to be able to operate on signals from the driving cabs of existing cars and, furthermore, with the driver in one of the new cars, controlling signals had to be the same as those the existing cars had been designed to accept. This predicated the use of the existing system of throttle control, which was notched in four steps. There was no disadvantage in this, for the Rolls-Royce continuously-variable transmission smooths out the steps imperceptibly and reduces the risk of wheel slip.

The Rolls-Royce equipment requires no gear-changing, and these signals are passed through the new cars without any note being taken of them. Locking-out of the torque converters is automatic and independent in the new cars without driver's action or signal along the train. Although no gear lever is required by the new cars, one was provided to give gear-changing signals for any cars of the older type which might be coupled to form a mixed train.

A sliding dog-clutch in the final drive on the driven axles reverses both new and existing cars, and the same reversing signals operate all cars in a mixed train. In existing cars, if the teeth meet end-on-end, the dogs are pulled into engagement by the drag through the gearbox in its neutral condition. The torque converters were arranged to come automatically out of neutral for an instant to drag the associated final drive into engagement if necessary: meanwhile, the engines in that car automatically hold at idling speed. The usual cab lights indicate when the final drives are engaged, and the train can be driven off in the normal way.

Whenever a gear is selected the torque converters move out of neutral to put the new cars in the driving condition. Thus, driver's instructions are the same whether he is driving from a new car or one of the former type. The only disadvantage of this is that the engines in the new cars are unnecessarily throttled down during gear changes in the old cars. If a train consists entirely of new cars, the driver can keep the throttle wide open all the time, and a blanking plate can be fitted to prevent the unwanted gear positions from being selected to no purpose.

Rolls-Royce is willing to investigate existing railcars to see whether a system can be devised to enable new cars powered by Rolls-Royce equipment to be coupled to them without harm or inconvenience.

Further information can be obtained from the Railway Traction Department of Rolls-Royce Limited, P.O. Box No. 31, Derby.

Freight Protection

AIR-BLOK is equipment for the support and protection of freight during transshipment. It incorporates inflatable cushions and the manufacturer claims that, using it, the cost of preparing a load of freight is very much lower than that of using conventional material and methods. Air-blok can be used and re-used. The blocking process is claimed to be 50 per cent. faster than that of conventional materials.

One man can block an entire wagon quickly and easily. The cushions are placed between units of cargo and inflated with an air hose. They can be quickly deflated, rolled and tied with built-in straps for easy return.

XUM

Two types are available: one consisting of a tough, synthetic rubber bladder encased in a canvas water- and rot-resistant cover; the second is designed for heavy-duty applications, which provides greater protection. There are two sizes. When fully inflated, the cushions measure 12 in. x 30 in. x 60 in., and 12 in. x 48 in. x 60 in.

Further details can be obtained from the manufacturer, the Firestone Tyre & Rubber Co. Ltd., Brentford, Middlesex.

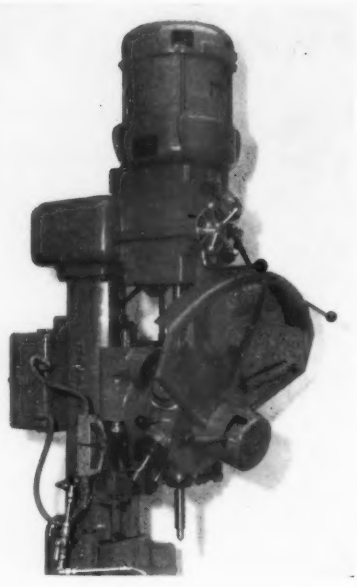
Programme Control for Bar Capstan Lathe

BY the Herbert Programme Control System, to which editorial reference was made in our November 20 issue, the starting, stopping, reversing, and changes of speed of the No. 2D capstan lathe chuck spindle are automatically controlled as the turret is indexed. Thus in production chuck work up to 9-in. swing or machining from bar material up to 1½ in. dia., operational fatigue and non-cutting times are reduced to a minimum. The fundamental advantage claimed is not solely elimination of the human element but the achievement of greater efficiency from unskilled labour, better quality work, and longer runs between regrinding of the tools.

Normal hand-indexing of the hexagon turret mechanically selects the appropriate control circuit for the turret face to be used. The effect gained is pre-determined by inserting miniature two-pin electrical bridges in a colour-coded plug board panel with six vertical columns. The right-hand of the two lower illustrations on this page shows the quickly-detachable panel set to control only from turret face six the following functions: clockwise spindle rotation, fast gear magnetic clutch, an intermediate motor speed, and spindle to stop at end of operation.

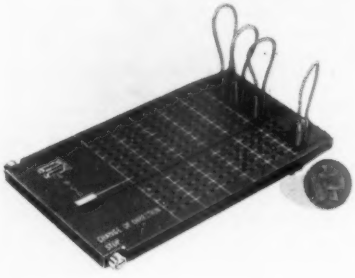
The whole series of up to six operations can be determined in the Process Department by preparing a punched card for superimposing over the panel to ensure correct insertion of the plugs. The usefulness of the machine as a conventional capstan lathe is regained by rotating a " hand/auto " selector switch on the eye-level main electrical control panel.

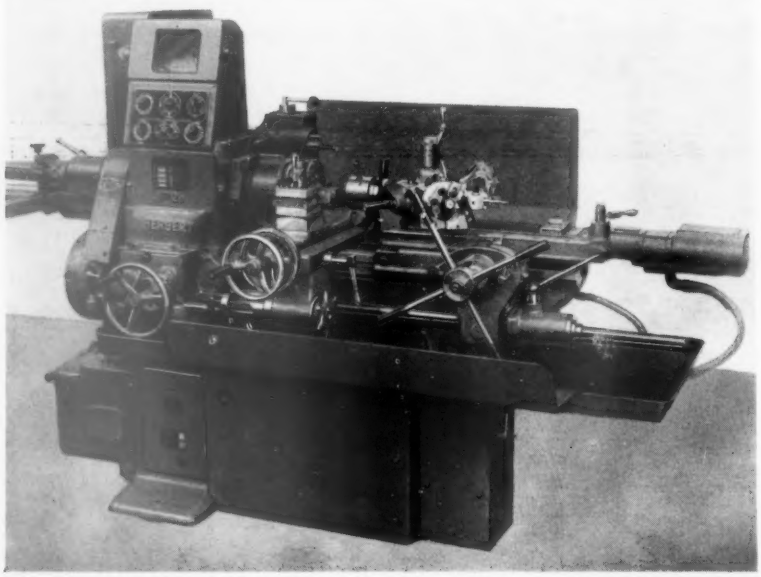
Further details may be obtained from Alfred Herbert Limited, Coventry.



Six-Spindle Drilling Machine

A TURRET-TYPE all-electric drill which is virtually a six-spindle machine occupying no more floor space than a standard two-spindle machine has been added to the range of plant manufactured by Alfred Herbert Limited, Coventry. For rapid production work six operations can be performed at one setting of both component and machine. The hand-indexing turret houses six No. 2 Morse spindles running in ball bearings. A single hand lever unclamps the turret, withdraws the locating plunger, and, after indexing has been carried out, re-positions the plunger, re-clamps the turret and engages the drive for the spindle in the operating position. Automatic reverse to any one or all spindles can be fitted at extra cost for use when threading. Maximum drill capacity is ⅞ in. dia. and taps of up to ¾ in. dia. can be used for mild steel and cast-iron. The stroke is 5 in. and is limited by a self-selecting adjustable stop screw for each turret station. Eight spindle speeds between 74 and 2,850 r.p.m., forward or reverse, can be selected instantaneously by gearing in conjunction with a four-speed motor. Three automatic power down-feeds are also incorporated. The working surface of the table is 24 in. x 15½ in. and the floor space occupied, 33 in. x 34½ in.





Freight Security Device

THE Seal-Rivet is a fastener for wagon doors which replaces ordinary rivets and seals, and is claimed to offer improved security and economy, to prevent loss of wagon destination identity, and to combine riveting and sealing in one operation. It can also be used to secure axlebox faceplates. The station code is simultaneously punched in the operation.

The equipment comprises a semi-tubular rivet with cross-holed shank and a hand press-tool with a conical nib and code-engraved punch. Method of operation is as follows:—

An eyeletted card label is wired to the rivet and the wire carried through the cross-holes and inside the shank of the rivet. This is then held in the press-tool and the wagon doors are closed and cotters positioned. The punch of the press-tool is partly withdrawn and the anvil inserted between the main cotter and the door so that its conical nib lies against one of the rivet holes. The press-tool is then screwed until the end of the rivet is set against the nib and shaped under the cotter by pressure. The wire holding the label is gripped in the cross-holes as they close and the station code is punched on the rivet head. The gripper is then reversed to release the rivet and the press tool removed, leaving the labelled rivet in the cotter.

Security is claimed to be such that the provision of a second rivet in the " L " cotter is not necessary. Nevertheless, another rivet without cross-holes can be used, if desired, either in that or in the main cotter.

When opening the wagon, the rivet holding the label is cut so that the wire is not damaged and the head of the rivet bearing the station code remains intact with the card label.

This rivet is being introduced on the Northern, South Eastern, and Southern Railways in India, after examination by the Commercial Committee of the I.R.C.A.

Further information can be obtained from the manufacturer, Fasteners & Wire Products, Bara Birwa, Alambagh, Lucknow, India. The manufacturer is willing to export and to issue licences for production in other countries.

" Pneuvalve " Sizes

THE range of the Westinghouse Globe and Marine Pneuvalves described in this section on November 20 is from 1½ in. to 6 in., and not from ½ in. to 6 in., as incorrectly intimated to us by the manufacturer.

English Electric Locomotives on British Railways

The diesel-electric 2,000-h.p. Type "4" English Electric locomotives, of which 52 have so far been built for British Railways, are being completed by the Vulcan Foundry Limited, a subsidiary of the English Electric Co. Ltd., at an average rate of six a month. Besides those already in service in the Eastern and North Eastern Regions, 27 have been delivered to the London Midland Region since September this year. Of these, eight locomotives are allocated to Edge Hill Motive Power Depot to operate express passenger services between London Euston and Liverpool Lime Street *via* Crewe.

The last-named services became entirely diesel-worked from November 2 pending electrification of the line which is due for completion in 1964-65 as mentioned in our November 6 issue. The performance of the Type "4" English Electric locomotives and reliability of the traction equipment are reported to be satisfactory. A description of this locomotive was given in our April 25, 1958 issue.

The Vulcan Foundry plant at Newton-le-Willows, Lancashire, which was established in 1830, currently employs just less than 3,000. Practically all the locomotive components are manufactured there except for the English Electric generators, motors, control gear, and 16SVT Mark II diesel engines. The plant is also engaged on home and export contracts, including Type "5" diesel-electric "Deltic" locomotives for the Eastern, North Eastern, and Scottish Regions of British Railways, and work will begin shortly on the building of a.c. locomotives for British Railways on routes electrified at 25 kV, 50 cycles.

Bridge Demolition at Pinner, L.T.E.

Engineers of London Transport Executive demolished the 65-ton brick arch of a bridge (MR48) carrying one of the two carriageways of Marsh Road, Pinner, over the Metropolitan Line, in the early hours of Sunday, December 6. This part of the bridge was demolished to make way for a new bridge section which will span both existing tracks and the new tracks to be laid on the south side of the line under the £9,000,000 improvement scheme for the Metropolitan Line between Harrow and Amersham.

The eastern half of the bridge was built before the war to span existing and future tracks, and because of the presence of this "half-bridge" explosives could not be used to demolish the brick arch.

During previous nights holes were cut in the brickwork of the arch to weaken it. At 3 a.m. on December 6 workmen with pneumatic tools knocked out the remaining brickwork and the arch fell on to a deck of heavy timber placed to protect the rails beneath. The rubble was cleared by crane and deposited clear of the tracks in time for the running of the first trains on Sunday morning.

The left-hand illustration shows the brick arch being prepared for demolition in the early hours of December 6. The timber deck is being laid beneath to receive the debris.

Institution of Railway Signal Engineers

A technical meeting of the Institution of Railway Signal Engineers was held on December 2, with Mr. D. G. Shipp, President, in the chair. Mr. D. L. Turner, British Railways Research Department, read a paper entitled "Wagon Resistance in Marshalling Yards."

Mr. Turner remarked that in recent years there had been considerable development in the design of marshalling yards but basic information on the behaviour of the wagons themselves had not kept pace with the requirements of the designers. Mr. Sadler's paper to the Institution of Civil Engineers in 1953 was based on certain measurements made at Whitemoor yard. Further measurements were made there by the Research Department during 1954 and 1955. These had since been augmented by the records that formed the basis of the present paper.

Resistance to Motion

He then defined the resistance to motion of a wagon and explained that it was divided into three parts: (*a*) that caused by interaction between the wheels and rails; (*b*) that caused by the wagon itself (e.g., bearing friction and badly adjusted brake gear), and (*c*) wind resistance caused by the passage of the wagon through the air, which was increased if the natural wind was blowing against the wagon. The sum of these three resisting forces divided by the wagon weight was termed the co-efficient of total wagon resistance, or rollability.

The tests made at Whitemoor and the methods and apparatus used in making them were then described, with some observations on curves, tread lubrication, and wagons. There could be a case for using sharper curves in marshalling yards, Mr. Turner maintained, thereby saving space in the layout, and curve lubrication would be more practicable. It had been found that wet reduced curve resistance but had little effect on straight track. This process had been tried, using paraffin, at Elkhart Yard on the New York Central and the results were said to be favourable.

With regard to wagons, it was stated that somewhere between 5 and 10 per cent had rolling resistances appreciably higher than the others and that if these were rectified the saving of damage they caused might pay for the cost of repairs. At present such wagons could only be detected in yards fitted with wagon resistance measuring equipment.

Wagon Behaviour Hard to Predict

The paper concluded with the remarks that the information given in it presented a rather sombre picture to the marshalling yard designer and made clear that the inherent variability of the wagons he must handle was so great that even with the best possible computers he would not be able to predict the behaviour of his wagons with sufficient accuracy for them to run free for more than about 500 ft. Only when marshalling yard designers accepted this unpalatable fact, or when some fundamentally new method of predicting wagon behaviour was discovered, would really satisfactory marshalling yards be possible.

Mr. D. G. Shipp opened the discussion. Messrs. Cardani, Howes, Sadler, Reynolds, Shepherd, Aldridge, Kubale, Baldwin, and Hamie spoke on various points arising out of the paper. The general opinion was that it was necessary to obtain more accurate prediction on wagon performance and the necessity for more rigid maintenance and inspection by the Carriage & Wagon Department.

One speaker was of the opinion that bad-running wagons should be marked as defective. Another stated he had known wagons that had run perfectly well on straight track, though the brake blocks became locked to the wheels on a curve.

The benefits arising from the use of hydraulic buffers were discussed. It was established that although the buffing speed could be increased without damage to the wagons themselves, there was little difference in the amount of impact experienced by merchandise in the wagons.

Laying timber decking to receive debris

After demolition, showing remains of arch on decking

Questions in Parliament

Subsidies to Nationalised Industries

Mr. Leslie Spriggs (St. Helens—Lab.) asked the Economic Secretary to the Treasury on December 3 what was the total value of subsidies given to the B.T.C., the National Coal Board, the Electricity Board, and the Gas Board, as each of these industries became publicly owned, and what was the difference between the subsidies paid to these publicly-owned industries and those paid to each of the above industries when privately owned over the last corresponding period of private ownership.

Mr. Anthony Barber: No subsidies have been paid to any of these industries since they were nationalised. Some grants of relatively small amount were paid to the industries during the years 1935-46, mainly to meet problems caused by the war and to encourage industrial development in areas of unemployment. It would not be possible to quantify these without undue expenditure of time and effort.

Mr. Spriggs: Publicly-owned industries, upon which the national economy rests, could do with an infusion of economic help.

Mr. Barber: The nationalised industries can borrow considerable amounts from the Exchequer. Since 1956, when the new system came into operation, they have borrowed £1,200 million from the Exchequer.

Racial Discrimination on Railways

Mr. Christopher Chataway (Lewisham N.—C.), in a debate on racial discrimination on December 7, said: "Three years ago, in the course of my work, I had to show in a B.B.C. feature that some branches of the N.U.R. were preventing coloured workers from taking vacant jobs as porters. It was right to do that because it was a mean piece of discrimination, but, from the angry letters which I received from railwaymen, it was made clear to me that they felt that the bargaining power and the status of their union and of their jobs were threatened. What they said to me was: 'It is all very well for you.' I took their point."

Railway Services in the Highlands

Mr. Hector Hughes (Aberdeen N.—Lab.) asked the Secretary of State on December 8 if he was aware that Government policy, as indicated in the Review of Highland Policy, Command Paper No. 785, was being negatived by cuts now being made in railway services in the North and North-East of Scotland; and, in view of this, what steps he was taking to implement Government policy as indicated in that Command Paper.

Mr. J. S. Maclay: The modification of these railway services is a matter for the B.T.C. and has been agreed by the Transport Users' Consultative Committee. The future development of transport services is under examination by the Scottish Transport Council and the Highland Panel.

Mr. Hughes: Has not the Secretary of State for a long time been advocating the industrialisation and re-population of the Highlands, and is not this step with regard to railways negativing that, and lessening the possibility of the development of the Highlands as they should be developed, particularly Aberdeen and the North-East?

Mr. Maclay: I am extremely concerned that transport facilities and services should be appropriate to the need. Whether it should be road or rail, and how the services are to be co-ordinated, are questions of great importance.

Mr. Arthur Woodburn (Clackmannan & East Stirling—Lab.): It is impossible in the Highlands to regard the question as one of purely economic payability. Planning of the Highlands is not something which can be done in the meantime on purely economic grounds, but must be done on the basis of preserving the Highlands for the future.

Mr. Maclay: I agree that there must always be a balance between the immediate economics and the long-term future.

Hardwood Sleepers

Mr. Wingfield Digby (West Dorset—C.) asked the Minister of Agriculture on December 7 whether he was yet in a position to give the results of trials of hardwood sleepers as arranged by the Forestry Commission.

Mr. John Hare: No. These trials have been arranged by the B.T.C. in conjunction with the home timber trade. The Commission states that it will be some two or three years before it is possible to reach conclusions.

Telephones for Trains

Mr. H. M. Clark (Antrim N.—U.U.) asked the Postmaster General on December 9 what progress had been made in the investigation into the practicability of installing public telephones on railway trains; and when such a telephone service would be introduced.

Mr. J. R. Bevins: The provision of public radio-telephones in railway trains is technically feasible, but the establishment of a satisfactory service would be very costly. There is not enough evidence of public demand at present to justify expenditure on such a service.

Avoiding collisions

Mr. Gilbert Longden (Hertfordshire W.—C.) asked the Minister of Transport on December 8 whether he would give a general direction to the B.T.C. to improve the points system on British Railways, so as to avoid collisions such as the one which occurred at Neasden on November 12.

Mr. Ernest Marples, in a written answer: No. This is not a matter for the issue of a general direction to the Commission.

Parliamentary Notes

Rolling Stock Co.'s Plaint

Viscount Hinchingbrooke (S. Dorset—C.), in the overnight debate in the House of Commons on December 8, on the Local Employment Bill, which replaces the Distribution of Industries Act, said that a prominent railway carriage and wagon building company in Yorkshire wrote to him on November 10 in these terms:

"In our industry [railway rolling stock manufacture] we had inflicted upon us in this country a very grave and serious hardship owing to the demand which was apparently being made in Scotland to find employment, by the Government placing a factory at the disposal of a new company, to whom the B.T.C. gave exceptionally large orders for railway wagons and carriages. The effect of that action has simply been, whilst finding employment in the Glasgow area, to put hundreds of men in this country, both building and repairing wagons, out of a job. Recently, we had one case where, although this company quoted the lowest price for some carriage stock, the order was given to the subsidised factory in Scotland. The effect has really been 'robbing Paul to pay Peter.'"

Lord Hinchingbrooke added that he had not obtained permission of the firm to give the name, but the letter was signed by the Chairman.

Mr. W. Baxter (West Stirling—Lab.) asked, for accuracy's sake, the name of the factory in Scotland.

Mr. W. Ross (Kilmarnock—Lab.): We all know that it is the North British Locomotive Company.

Staff and Labour Matters

British Railways Commission Assurance About Redundancy

The following is a statement which has been issued by the British Transport Commission in regard to redundancy among conciliation staff:—

"It is recognised by the British Transport Commission that anxiety about the continuity of their employment may affect the attitude of certain railway staff to schemes of modernisation and improved productivity.

"To remove this anxiety and to encourage the full support of the staff, the Commission are prepared, in principle, to give an assurance against discharge on the grounds of redundancy to all Conciliation Grades who were in the service on 1 January, 1958.

"The undertaking would be given on the understanding that redundant staff will be prepared, if necessary, to accept offers of alternative employment which may involve a change of work and which may call for them to move their place of employment.

"The detailed application of these arrangements is to be the subject of further negotiation.

"An agreement covering the position of footplate staff is already in operation, arising from the agreement on manning of diesel and electric locomotives."

MAIN LINE TRACK CLOSED BY BOLTING HORSE.—The track of the British Railways, London Midland Region main line into London was closed for three hours on December 5, at Kilburn, N.W., after a horse which had bolted onto it had been killed by a train.

INCREASED DEMAND FOR STEEL.—A record output was achieved in November by the steel industry in Britain. Production last month averaged 458,600 tons a week compared with 441,400 tons in October, and the prevous record of 443,200 tons reached in May, 1957. Compared with November, 1958, steel production was 30 per cent higher. Demand by all types of consumer is reported to have risen. The steelmaking furnaces were able to work to about 95 per cent of their capacity for the final quarter of 1959; the Iron & Steel Board estimates that production will be 25 per cent higher than in the corresponding period of 1958. All the steelmaking firms are stated to have shared in this increase in their output of ingot steel, and have been operating their furnaces at or near capacity. The manufacturers of some heavy railway material report a slight increase in orders. As there has been no apparent rise in consumption in these industries, it is considered likely that some of the buying is for stock.

K. & L. STEELFOUNDERS & ENGINEERS EXPANSION.—Due to increasing demand from home and export markets, for Jones mobile cranes, K. & L. Steelfounders & Engineers Limited, a member of the George Cohen 600 Group of Companies, is to expand its Engineering Division. A long lease has been arranged for a Board of Trade factory at Newburn-on Tyne. This works is on the Newburn Trading Estate. It has a floor area of 24,000 sq. ft., is complete with power, lighting, heating, and other services. Due to the shortage of skilled men in the Letchworth area, and in conformity with Government policy, this expansion has been planned to take the work to where men are available. It is expected that a start will be made at Newburn in the next few weeks with a dozen or so machines, and a build up will continue through 1960. Eighteen months ago, the Deputy Prime Minister, Mr. R. A. Butler, opened a K. & L. Works at Halstead, Essex.

Contracts and Tenders

Diesel shunting locomotives for the Turkish State Railways

Fried Krupp Maschinenfabriken has received an order from Eurofima for seven 650-b.h.p. diesel-hydraulic shunting locomotives, of the German Federal Railways V.60 standard class, for service on the Turkish State Railways; and the Maschinenfabrik Esslingen has received an order for six of the same locomotives from Eurofima for service on the same railway.

African Explosives & Chemical Industries Limited has ordered a second 750-h.p. diesel-electric locomotive from the English Electric Co. Ltd., for service at its Modderfontein factory.

Rheinstahl Siegener Eisenbahnbedarf has received an order from the Finnish State Railways for five sliding side/sliding roof wagons and five sliding roof/fixed side wagons of SEAG type, and for five lift dump wagons.

Vickers-Armstrongs Limited has received an order from the Shaw Savill Line for a passenger vessel to run in its Round-the-World service in conjunction with s.s. *Southern Cross*, for delivery in April, 1962. The new vessel will carry about 1,400 passengers, all one-class, and the passenger accommodation will follow, in general, the design which has proved so popular on the *Southern Cross*. The vessel will be of about 22,000 tons gross register with a speed of 21 knots, on a horse power of 22,000 s.h.p., and will be built in Vickers-Armstrongs' Yard at Walker, Newcastle-upon-Tyne.

Sanders & Forster Limited, a member of the Chamberlain group of companies, has secured a substantial order for its S & F clear portal standard buildings for use in the Warri Dockyard contract in Nigeria. The main contractor is Gammon (Nigeria) Limited, and the Consulting Engineers are Messrs. Coode & Partners. The Warri Dockyard contract includes the erection and sheeting of the buildings in addition to the supply of material and this will be carried out under the supervision of the company's new technical representative for West Africa, Mr. W. H. Rankin, who will be taking up his duties in January, 1960.

British Railways, London Midland Region has placed the following contracts:

Incinerator Co. Ltd.: installation of centrifugal water spray dust catcher to existing incinerator at London St. Pancras Goods depot

Wilson Lovatt & Sons Ltd.: earthworks, fencing, and drainage for bridge 319 at Stoney Road, Coventry and also temporary service bridge and diversion of cables for bridge 321 at Warwick Road, Coventry

Trinidad Lake Asphalt Co. (North Western) Ltd.: asphalt re-surfacing of Edge Hill Goods Depot, Liverpool

A. V. Shenton Limited: shed office block and amenities for freight terminal at Stoke-on-Trent

Leonard Fairclough Limited: reconstruction of station forecourt

D. B. Evans (Bilston) Limited: construction of traders' accommodation at Leicester Queen Street, Freight Terminal.

The Special Register Information Service Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Queensland:

200 20-ton hopper ballast wagons, class VTX.

The issuing authority is the Queensland Government Railways. Bids should be sent to the Secretary, Commissioner for Railways, Adelaide Street, Brisbane, Queensland. The closing date is January 12, 1960. The Board of Trade reference is ESB/28193/59.

Further details relating to the above tenders together with photo-copies of tender documents can be obtained from the Branch (Lacon House, Theobald's Road, W.C.1).

Notes and News

Railway Tea Kiosks not Rateable.—Mr. Erskine Simes, Q.C., a member of the Lands Tribunal, in London last week upheld a local valuation court decision that four tea kiosks at York Station were not rateable. He pointed out that his decision must affect many similar British Railways kiosks. Access to the York kiosks could only be obtained by those travelling by train or holding platform tickets.

Trains Delayed by Mine Washed Ashore.—Traffic was delayed for some hours last week on the Folkestone-Dover line of British Railways, where it runs along the shore, because a mine had been washed up 100 yd. from the track near Shakespeare Halt. Trains travelled at reduced speed past the spot. Access to the shore is possible only by rail, and a special train was run from Dover Marine for a naval mine disposal squad, which made the mine safe.

Steel Co. of Wales Ltd. Final Dividend.—The Steel Co. of Wales Ltd. is to pay a final dividend of 6¼ per cent, as forecast last June, making 10 per cent for the 53 weeks to October 3, 1959, against the effective 9 per cent for the previous 52 weeks. The trading surplus, before depreciation, increased by £1,100,000 to £23,290,814. After heavier provisions for depreciation, fixed assets replacement reserve and interest, and a tax charge lower by £1,000,000, the balance of profit is increased by £3,038,847 to £4,229,150.

British Standard for Universal T-bars.—A new supplement, No. 1 (1959), to British Standard 4A(1934), T-bars (universal, heavy flange, and long stalk), specifies universal T-bars cut from the universal beams and column sections published in British Standard 4B. The supplement deals also with the T-bars originally covered in B.S. 2566, which is withdrawn. Sections are now designated by nominal size in inches and weight per ft. in lbs. Also properties such as moments of inertia, radii of gyration, elastic moduli, and plastic moduli are specified. Copies, price 5s., may be obtained from the British Standards Institution, 2, Park Street, London, W.1.

Exhibition, "Courtaulds in Transport."—A major exhibition, entitled Courtaulds in Transport, will be held in Celanese House, Hanover Square, London, W.1, for a week from January 21, 1960. It will demonstrate the many products of Courtaulds Limited and subsidiaries for the transport industry, which include man-made furnishing textiles, tyre-cord, chemicals, and paints. Developments resulting from co-operation with the industry in respect of weight-saving, durability, comfort, economy, and safety will be illustrated. It is intended that exhibits will include completely fitted-out rail and road passenger vehicle compartments, also a cabin of a ship and a section of an air liner cabin. Admission is by invitation or trade card.

Mail Damaged by Fire in Southern Region Train.—Fire broke out in the brake van of a Brighton-London Bridge train, British Railways, Southern Region, on December 7. Twenty bags of parcels were badly damaged before firemen put the blaze out.

Public Address System for Bedford Station.—Loudspeakers are being installed to cover all platforms at Bedford Midland Road Station, British Railways, London Midland Region, in time for the introduction of the St. Pancras-Bedford diesel services on January 4.

United Steel Dividend.—The United Steel Companies Limited are to pay a final dividend of 11 per cent for the year ended September 30, 1959 (against 8 per cent. for the preceding 12 months). This makes 15 per cent (12½ per cent) for the year. The companies report an increase of £1,500,000, to £22,011,000, in the group surplus, before depreciation. After providing £4,363,000 (£3,779,000) for depreciation, there is a surplus of £17,648,000, against £16,732,000.

Basford Vernon Station to Close.—Basford Vernon station between Nottingham Midland and Mansfield, in the London Midland Region of British Railways, is to be closed to passenger traffic from January 4. Passengers should book to Fulwell Market or Nottingham according to direction of travel and thence by buses of the Nottingham Corporation or Trent Motor Traction Co. Ltd. Parcels traffic and passenger train merchandise will be dealt with at Nottingham.

Hydrum Mechanical Handling Equipment to be built at Rochester.—R. H. Corbett & Co. Ltd., of Hydrum Works, Burgess Hill, Sussex, one of the Woodfield Rochester Limited group of companies, will move to the premises of its parent company at Rochester, Kent, with effect from February 1, 1960. There, greatly increased facilities will be provided for further developments in fork lift truck attachments and mechanical handling equipment for stacking, racking, lifting, loading and storing. From that date all communications should be addressed to R. H. Corbett & Co. Ltd., Frindsbury Works, Rochester, Kent. Telephone Stroud 78421.

Hull Stations Converted to Halts on Hornsea and Withernsea Branches.—To effect immediate economies, the following stations on the Hull-Hornsea and Hull-Withernsea branches of British Railways North Eastern Region, are to be converted into unstaffed halts on January 4: Sutton-on-Hull, Swine, Ellerby, Whitedale, Sigglesthorne, Botanic Gardens, Stepney, Wilmington, Southcoates, Marfleet, Hedon, Ryehill & Burstwick, Keyingham, Ottringham, and Patrington. The Transport Users' Consultative Committee for the Yorkshire Area has agreed these arrangements but will consider any reasonable representations which might be made for the restoration of facilities. Ellerby Goods Station is to be converted to a public delivery siding. Conductor-guards in the trains, equipped with Setright Register roll ticket machines, will issue tickets. On certain mornings during the summer period, staff will attend at Botanic Gardens, Stepney, Southcoates, and Marfleet, to issue tickets. Forwarded and received parcels and small consignments of goods traffic will continue to be collected and delivered by British Railways' road vehicles. Parcels by passenger

train may still be handed in at or collected from Marfleet, Patrington, and Sutton-on-Hull, but with the other unstaffed halts, parcels will be collected or delivered at sender's/consignee's premises on request to Hull Paragon, Patrington, Hornsea Bridge, or Hedon. There will be no change in the present arrangements for dealing with wagon-load freight traffic except at Ellerby.

Collision Averted at Waterloo Station, Southern Region.—Suburban services were disrupted at Waterloo Station, British Railways, Southern Region, on December 11, when a train trying to enter platform 3 came within yards of a head-on collision with a train about to leave the platform. Points were damaged by the incoming train running through them, and the circumstances under which the train did get into the platform are being investigated.

Southern Region Publicity.—The poster reproduced in the illustration was commissioned by the department of the Public

British Railways, Southern Region, poster printed by photo-litho in eight colours by the Baynard Press

Relations & Publicity Officer, British Railways, Southern Region, and produced from a transparency. It was printed in photo-litho in eight colours by the Baynard Press.

Christmas Trees at Scottish Stations.—Principal stations of British Railways Scottish Region in Glasgow, Edinburgh, Dundee, and Aberdeen have been decorated with illuminated Christmas trees in support of appeals on behalf of charitable organisations. The displays will remain until the early days of the New Year.

Massey-Ferguson (Great Britain) Limited, Change of Name.—Management of all United Kingdom operations by the Massey-Ferguson group has been taken over by Massey-Ferguson (United Kingdom) Limited which is the new name given to the company previously called Massey-Ferguson (Great Britain) Limited.

Para Electric Railway & Lighting Co. Ltd.—The report of the directors of the Para Electric Railway & Lighting Co. Ltd. points out that for some years past they have not been able to submit any accounts, because there had been no access to the books which have been in the hands of the Municipality of Belem since the seizure of the undertaking in 1947, and states they are of the opinion this state of affairs will continue. Accordingly copies of the last audited accounts, to November 30, 1947, will in future be available for inspection at each annual meeting and at the offices at any time. It is understood the smaller and more workable Commission approved by the President of Brazil has been formed and is considering company's claims.

Increased Traffic on Festiniog Railway in 1959.—The Festiniog Railway Company, states that the 1959 summer season was the most successful since restoration of passenger services in 1955. Nearly 76,000 passengers were carried between Easter and the end of September, against just over 60,000 in 1958.

United Lubricants Limited Dividend.—As forecast, a dividend of 15 per cent for the year ended March 31, 1959, is to be paid by United Lubricants Limited, on the increased capital. As profits for the company are showing an increase, the directors have declared an interim dividend of 5 per cent.

Closure of Harwich-Shotley-Felixstowe Ferries Opposed.—After the British Transport Commission proposal to close on December 31 the ferry service linking Harwich, Shotley, and Felixstowe had been opposed by representatives of eight local authorities at a meeting of the East Anglian Transport Users' Consultative Committee at Felixstowe, it was stated that the service would continue to operate until the committee's recommendation was known and a decision would be made in the New Year.

Mobil Oil New Dining and Recreational Facilities at Birkenhead.—The Mobil Oil Co. Ltd., recently opened new dining and recreational facilities for the staff in a new building at its works at Birkenhead. A kitchen on the ground floor is directly linked and integrated with two dining halls, capable of seating 252. On the first floor, recreational facilities include a games room and a lounge, also a small dining room seating 12. The whole building is equipped with a built-in speaker system with facilities for announcements, music on records or radio programmes.

Good Use of Road Haulage Vehicles.—Mr. R. N. Ingram, National Chairman of the Road Haulage Association, stated in a speech to the Birmingham Rotary Club last week that the members of the R.H.A. operated about 100,000 vehicles, less than 10 per cent of the total number of goods vehicles in the country, over a million of which ran under "C" licences. With this comparatively small proportion of the total number of vehicles it was estimated that R.H.A. members carried something like one-third of all the traffic that went by road, rail and inland waterways in Britain.

New Diesel Locomotive - Servicing Shed at Hitchin.—Work will begin shortly on a scheme to provide modern facilities for the day-to-day servicing of diesel locomotives at Hitchin, British Railways, Eastern Region, in connection with the change-over from steam operation on the suburban and Great Northern main-line services into Kings Cross. The new Hitchin depot will be used for the fuelling and servicing of 13 main-line diesel locomotives and six diesel shunting locomotives. It is to be constructed near the disused goods shed of the former Midland Railway. The site of the existing shed is needed for the future enlargement of the station itself. The main features of the work will include two inspection pits with covered area, fuelling and lubricating facilities, and alterations to permanent way. The work will be carried out by George Wimpey & Co. Ltd., and the shed is expected to be in use by the spring of 1960.

Britool Wrench and Service Equipment.—To achieve more efficient operation and eliminate overlapping it has been decided to concentrate the activities of Jenks Bros. Ltd., and its subsidiary the British Tool & Engineering Co., Ltd., in one new company to be named Britool Limited. This will be effective as from January 1, 1960, and all orders and communications should be addressed to Britool Limited, Britool Works, Bushbury, Wolverhampton, from that date.

Putting Standards to Work.—As a result of many requests for advice and assistance in setting up company standards departments, the British Standards Institution has published a guide to explain the correct functional responsibility of such departments in industry. *The Operation of a Company Standards Department* is sponsored by a joint committee of the B.S.I. and the Institution of Production Engineers. It outlines some of the obvious savings which can result from the efficient use of standards but it makes the point that exact evaluation of these is difficult if not impossible. The use of British Standards in formulating company specifications is indicated.

British Standard for Characteristics of Flexible Couplings.—A new British Standard publication, B.S. 3170:1959, Characteristics of Flexible Couplings for Power Transmission deals with the performance characteristics of flexible couplings for shafts, together with keyways, limits and fits, and bore sizes. The standard does not apply to flexible shafts. A series of general requirements is followed by sections on dimensions, limits and fits, components, marking and guarding. An appendix provides notes on methods of checking angular and parallel alignment of couplings. Copies, price 4s. 6d., may be obtained from the British Standards Institution, 2, Park Street, London, W.1.

Withdrawals of Passenger Services in London Midland Region.—Two passenger services are being withdrawn by British Railways, London Midland Region, from January 4, because they are unremunerative. They are those over the former Wirral Railway, between Bidston and Seacombe, and over the former L.N.W.R. between Crewe and Northwich Parcels and passenger train traffic now handled on the former section will be dealt with at Birkenhead Woodside. On the Crewe-Northwich line, Middlewich Station, will be closed; parcels, passenger train merchandise and goods traffic will continue to be dealt with as hitherto. Bus services operate in the areas served by both lines to be closed.

No Limit to Daily Journeys on Season Ticket.—To increase its revenue by £20,000 to meet higher costs, the South Wales Transport Co. Ltd. recently made application to the South Wales Traffic Commissioners, requesting that season tickets should be limited to one round trip a day. The Commissioners rejected this application, but granted one for an increase in fares. Regarding the number of journeys on season tickets, Mr. I. Owen, the Chairman of the Commissioners, stated: "These tickets are clearly used by people who wish to make two round trips or less a day. It cannot be said that two return journeys in a day is making unreasonable use of season tickets." At the hearing of evidence in November, witnesses for the company said that a check on the use of season tickets disclosed that 57·3 per cent used their tickets for more than one round trip a day.

New Stock in Service on the Piccadilly Line, L.T.E.—The first train made up of vehicles ordered from Metropolitan-Cammell Carriage & Wagon Co. Ltd. last year was placed in service on the Piccadilly Line, London Transport Executive, last Monday. The order was for 532 vehicles with unpainted light-alloy bodies, rubber suspension, and fluorescent lighting. Further deliveries will be made progressively.

Machine Tool Research.—The Machine Tool Trades Association has undertaken to give further consideration to the type of research organisation most suitable to the industry. This is announced by the Department of Scientific & Industrial Research after discussions with the M.T.T.A. resulting from a recent D.S.I.R. survey of the industry. The M.T.T.A. representatives have agreed that much closer co-operation is necessary between engineers and designers in industry, on the one hand, and the research work of universities, colleges and research institutions on the other.

Pondicheri Railway Co. Ltd.—The Board of the Pondicheri Railway Co. Ltd., states that the report and accounts at the recent annual general meeting for the year ended March 31, 1959, could not be presented at the recent annual meeting, as the accounts had not been received from India. The company will be faced with losses in both this and the preceding year. The company depends entirely on the Southern Railway of India for working the railway and the very high operating ratio for the working expenses charged by the Southern Railway has led to a loss in working. It is estimated that the operating ratio for the year ended March 31, 1958, will be 97·92 per cent and that for the succeeding year 98·13 per cent. The directors' reports and annual accounts for both those years will be issued as early as possible but in the meanwhile it will not be possible for any dividends to be declared for either of those years.

L.M. Region Stations to Remain Open.—British Railways, London Midland Region, has decided not to close certain stations which had been due for closure under proposals announced in May. The new decision had been taken because a loss of revenue would be entailed or the savings would not be great enough to warrant withdrawal of train services. The stations are:—Bickershaw and West Leigh, between Glazebrook and Wigan; Bolton-le-Sands, Hest Bank, and Milnthorpe, between Lancaster and Carlisle; Bromley Cross, between Bolton and Blackburn; Long Buckley, between Northampton and Rugby; Braystones, Drigg, Green Road, and Silecroft, between Barrow-in-Furness and Whitehaven; Gargrave, between Leeds and Hellifield; Linby and Newstead, between Nottingham Midland and Mansfield Town; and Normacot, between Derby and Stoke-on-Trent.

Steel Co. of Wales Ltd. Expansion Plans.—The board of the Steel Co. of Wales Limited has approved a new development plan, the fourth, and has submitted the plans to the appropriate authorities for their approval. The cost is estimated at about £30,000,000, and increased production is expected to begin at the end of 1961. The new plan is designed to increase annual production of steel ingots to 3,650,000 tons, with consequent increases in output of steel sheets and tinplates. The company's current annual production of steel ingots is 3,000,000 tons. The third development plan, estimated to have cost some £52,500,000, was completed in the middle of this year, and the first of the three new converters was heated up and brought into operation during the first week in July. A continuous casting plant is to be installed for the production of steel slabs—the first time that such a process has been introduced on a large scale in Britain. Alongside the present 80-in. hot strip mill a smaller 48 in. wide hot strip mill will be erected.

Institute of Traffic Administration Annual Conference.—The Institute of Traffic Administration annual conference will be held on May 20–22 at Nottingham. The headquarters will be the Black Boy Hotel. The proceedings will open on the evening of May 20 with a discussion on the future pattern of traffic in Britain. On May 21 there will be a visit to the British Railways marshalling yard at Toton. The annual dinner and dance will be held at the Masonic Hall, Nottingham, in the evening, when the President, Lord Merrivale, will receive the guests.

Elevated Railway Planned for Bulawayo.—A new design of railway known as the Skyway is to be built at the Central African Trade Fair at Bulawayo, Rhodesia, next year. The track consists of almost square reinforced concrete strips set 6 ft. apart on reinforced concrete piles 15 ft. above ground. Trains will be air-conditioned and drawn by diesel engines. In town the Skyway will cost £30,000 a mile; in the country about £20,000. The locomotives will cost £13,000 each and passenger coaches £6,000 to £7,000. Operating costs are estimated at a penny a mile.

Railway Correspondence & Travel Society Publications.—Two honorary assistant publications officers are to be appointed to assist Mr. T. J. Edgington with the increasing demand for Railway Correspondence & Travel Society publications. From January 1, 1960, all inquiries and requests for society publications should be sent to Mr. N. J. Claydon, Hon. Assistant Publications Officer, R.C.T.S., 19, Dene Court Road, Olton, Solihull, Warks. Mr. Edgington is continuing in office as Hon. Publications Officer, and retains his seat on the management committee of the society. Mr. J. Flay is the other assistant appointed.

Russian Consignment Handled by British Railways.—British Railways recently handled a large consignment of factory equipment *en route* for Russia. Geo. W. King Limited secured an order for 2,000 tons of materials handling equipment and asked British Railways to help in the transport arrangements. British Railways road vehicles brought the first consignment of 30 cases weighing a total of 153 tons to Kings Cross Goods Depot last week. Mobile cranes hoisted the equipment on to a freight train waiting to take it to Hull, where the cargo was put aboard a Russia-bound ship. Other consignments will follow later.

British Standard for Terminal Markings for Electrical Machinery.—Because of the wide range of terminal markings covered by the 1938 edition of British Standard 822 and with the intention of including further terminal markings in a revision of the standard, the new edition of B.S. 822 is being published in a series of parts designed to fit into a binder. Four parts have already been published and Part 5, now available, gives the terminal markings for the input terminals of composite apparatus, *i.e.*, apparatus comprising different components which are permanently mounted and wired together. The markings are also generally applicable for the input terminals of apparatus not the subject of a British Standard. Copies, price 3s., may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1.

British Transport at the Schoolboy's Exhibition.—A quiz competition arranged by the British Transport Commission, will be among the features at the Schoolboy's Own Exhibition which opens at Olympia, London, W., on December 28. The competition, entitled "Just the Ticket," will be held in a cinema on the B.T.C. stand on the ground floor of the National Hall, where films made by the British Transport Film Unit are to be shown. Admission to the cinema will be free, and at the end of each performance a sporting, television, radio, or stage personality will put questions on railways, road haulage, docks, and waterways to members of the audience chosen by ballot. The winners will receive prizes given by the Exhibition organisers and tickets for the final performance on the last day of the Exhibition, January 9, when a special quiz will take place for more valuable prizes. The display at the B.T.C. stand will include a large working model layout depicting various activities of the nationalised railway, road,

A large export case, part of the 2,000-ton order consigned to Russia, being craned at Kings Cross Goods Depot

docks and waterways undertakings, and individual models, photographs and colour transparencies, also an inquiry counter staffed by representatives of B.T.C. services. The programmes to be shown in the cinema will be selected from the following: "Report on Modernisation" (examples of progress with the British Railways modernisation plan); "Elizabethan Express" (longest daily non-stop railway run in the world, between Kings Cross and Edinburgh); "Signpost" (modernisation and electrification of the Manchester-Sheffield line); "Snow Drift at Bleath Gill" (rescue of a snow-bound goods train); "Under Night Streets" (maintenance work on London Underground at night); "Long Night Haul" (development of British Road Services general haulage trunk services); "Ocean Terminal" (turn-round of s.s. *Queen Elizabeth* and *Queen Mary* at Southampton); and "Broad Waterways" (life and work on the broad waterways of North East England).

National Models Exhibition.—Prizes for schools and individual pupils or classes will be awarded at this year's National Models Exhibition which opens at the New Horticultural Hall, Westminster, London, S.W.1, on December 31, 1959, and continues until January 9, 1960. Awards from the U.S.S.R. and the United States are included in the list of prizes, and the premier trophy is a cup presented by the Duke of Edinburgh.

Aircraft-Marine Products (Great Britain) Limited, Centralisation.—Aircraft - Marine Products (Great Britain) Limited, which markets A-MP solderless terminations, has vacated its offices at 60 Kingly Street, Regent Street, W.1, and is now installed in a new building at Amplo House, 87-89, Saffron Hill, London, E.C.1. Telephone: Chancery 2902-8. This four-storey building is the head office for the company and houses the research laboratory, formerly at Bournemouth, the sales and engineering departments, the prototype and service workshops, and the International Trade Division, previously at Bedford Row.

Mechanical Engineering Research Board Report.—Further developments in the work of the National Engineering Laboratory at East Kilbride are announced in the last annual report of the Mechanical Engineering Research Board published this week. The Mechanical Engineering Research Board was replaced by a Steering Committee last April, at the same time as the name of the Laboratory was changed. The report of the Director of the Laboratory, Dr. D. G. Sopwith, which is included in the same volume, describes the work in progress during the year. This includes research into slipping of locomotive wheels, and laboratory tests suggest that the adhesion between railway wheels and rails may be increased considerably by applying a solution of sodium metasilicate to the surfaces. Full scale tests are now desirable to see whether similar improvements can be obtained in practice.

Eastern Region Christmas Holiday Passenger Services.—British Railways, Eastern Region, is to run 382 additional main-line trains during the Christmas and New Year holiday period. Many of these extra trains will augment the services between London and Scotland, the West Riding of Yorkshire, Newcastle, and principal towns in East Anglia. Seat and sleeping berth reservation facilities are being extended to include many of the additional long-distance trains. On Christmas Day and Boxing Day a modified Sunday service will operate and special arrangements have been made for the heavy home-going traffic expected on December 27. The numbers of additional main-line trains to be run are 10 today (December 18), and 44, 140, 87 and 65 on December 23, 24, 27 and 28 respectively. Besides the usual additional workings from Kings Cross and Liverpool Street, before Christmas, many additional trains will be run to London. Additional cross-country services will be operated. There will be additional night sailings on December 18 and 23 from Harwich to the Hook of Holland. About 20,000 passengers to and from the Continent are expected to pass through the port of Harwich during the holiday period. Pullman car services from and to Kings Cross will operate throughout the holiday period except for Christmas Day and Boxing Day.

British Railways, Southern Region, Lecture & Debating Society.—A social evening is to be held by British Railways, Southern Region, Lecture & Debating Society on January 8, 6.30 to 11 p.m., at Battersea Town Hall (Lower), near Clapham Junction. The price of tickets is 2s. Friends are invited. The subjects for the prize essay competition are: "Selling Transport," "Peak Traffic Problems and Possible Solutions"; and "What Improvements are most Urgently Needed on British Railways?" A prize of £10 is offered. The closing date for entries is January 31.

Mobil Oil Co. Ltd. Tank Wagon Shuttle Service.—The Mobil Oil shuttle service of tank wagons to Coventry from its terminal, at Coryton, Essex, adjacent to the refinery, is reported to be functioning well. Each train of 20 tank wagons transports nearly 120,000 gals. of petroleum products. The wagons were built by the Powell Duffryn Engineering Co. Ltd., and were specially designed for bottom loading and discharge. Both operations can be controlled at ground level from each side of the vehicle. The same Mobil Oil Company diesel locomotive shunts the wagons at Coryton, and hauls empty and loaded rakes over the Corringham Light Railway between Coryton and the Thames Haven branch of the London, Tilbury & Southend Line of British Railways at Stanford-le-Hope.

Forthcoming Meetings

January 5 (Tue.).—South Wales & Monmouthshire Railways & Docks Lecture & Debating Society, Cardiff Branch, at the Angel Hotel, Cardiff, at 6.30 p.m. Address by Sir Leslie Ford, General Manager, Port of London Authority, on "The Port of London revisited," illustrated.

January 5 (*Tue.*).—Railway Correspondence & Travel Society, West Midlands Branch, at 64, Holyhead Road, Coventry, at 7.30 p.m. Paper on "Red earth and green engines," (Midlands ironstone mine railways), by Mr. E. S. Tonks.

January 6 (*Wed.*).—Railway Students' Association, at the London School of Economics & Political Science, Houghton St., Aldwych, W.C.2. New Year dinner and dance.

January 6 (*Wed.*).—Institution of Railway Signal Engineers, London Section, at the Institution of Electrical Engineers, Savoy Place, W.C.2, at 6 p.m. Paper on "The electrical properties of concrete sleepers," by Mr. E. Morgan, British Railways Research Centre.

January 7 (*Thu.*).—Institution of Electrical Engineers, at Savoy Place, London, W.C.2, at 5.30 p.m. Second Hunter Memorial Lecture, "The protection of electrical systems," by Mr. H. G. Bell.

January 7 (*Thu.*).—Railway Correspondence & Travel Society, Bristol & District Branch at the Grosvenor Hotel, Bristol, 1, at 7.15 p.m. Paper on "Operating and signalling in the Bristol District," by Inspector R. Wellman.

Railway Stock Market

Recent uncertainty in stock markets has been followed by a rally which carried the *Financial Times* industrial share index to a new peak. Sentiment has been helped by hopes that an increase in the bank rate may prove unnecessary. Although industrial shares have rallied strongly, British Funds have made only a moderate improvement. The rise in industrials has been due in a large measure to shortage of shares in the market at a time when there has been steady buying by unit investment and other trusts.

There was again only a very small business recorded in foreign rails, but Canadian Pacifics have tended to strengthen at $47½, but the 4 per cent preference stock eased to 60¾; the 4 per cent debentures were 65½.

Antofagasta ordinary and preference stocks were steadier at 16 and 28½ respectively with the 5 per cent (Bolivia) debentures at 95½. Costa Rica ordinary stock has been steady at 21½, Chilean Northern first debentures were 60, Paraguay Central prior debenture 18½ and Guayaquil & Quito assented bonds 81½. Brazil Railway bonds were 7 and San Paulo Railway 3s. units kept at 1s. 6¾d., while United of Havana second income stock was again quoted at 6. Mexican Central "A" bearer debentures were 55½.

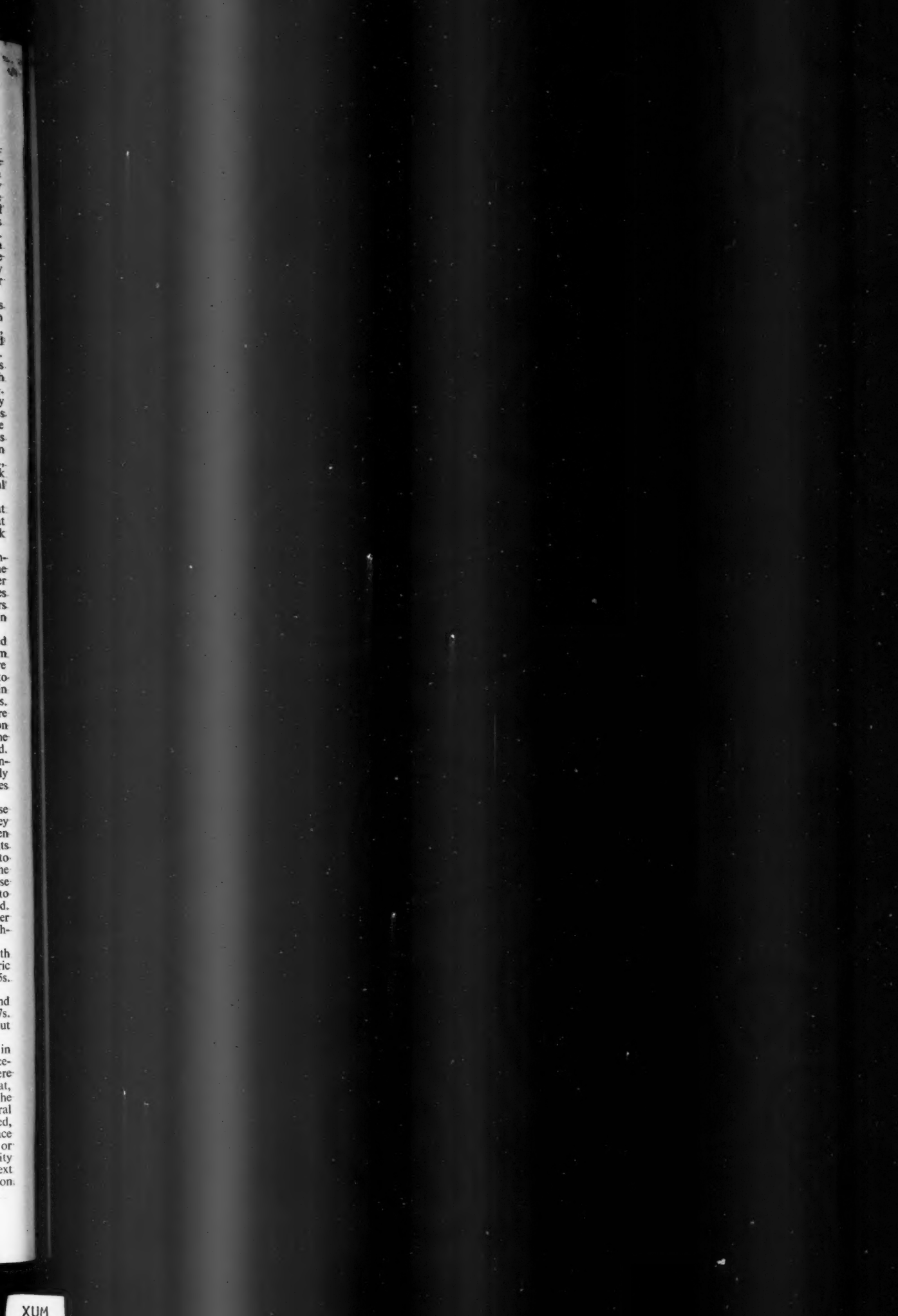
Nyasaland Railways shares remained at 11s. 6d. and the 3½ per cent debentures at 54½. West of India Portuguese capital stock was again 108½.

Shares of locomotive builders and engineers have been firmer in sympathy with the buoyant trend in markets generally. Beyer Peacock 5s. shares were 8s. 6d., Charles Roberts 5s. shares 17s. 6d., Wagon Repairs 5s. shares 11s. 4½d. and Gloucester Wagon 10s. shares 15s.

North British Locomotive shares changed hands around 9s. Elsewhere, Birmingham Wagon were 28s. 9d. G. D. Peters were 20s. 7½d., Vickers have rallied strongly to 32s. 9d. in a fairly general improvement in leading engineering and kindred shares. Cammell Laird 5s. shares at 8s. 4½d. were better, too, but there was a moderate reaction in Babcock & Wilcox to 44s. 3d. Stone-Platt Industries shares eased from 60s. 3d. to 59s. 6d. while in other directions, Ransomes & Marles 5s. shares have held steady at 25s. 3d. and Pollard Bearing 4s. shares were 35s. 9d.

The market is assuming that in due course the latter company will require more money to cope with expansion plans, and that when an issue is made it is likely to be a rights offer to shareholders. Next year is likely to see many new industrial issues, because the emphasis will be on new plant to increase efficiency. Power Gas 10s. shares were up to 83s. 1½d. and Davy-United were 111s. 9d. pending the merger proposals. In other directions, Mather & Platt shares strengthened to 51s. 6d.

Associated Electrical were up to 60s. with English Electric at 46s., General Electric 43s. 3d., and Crompton Parkinson 5s. shares 17s. 6d. B.I. Cables were 55s. 9d.

Pressed steel 5s. shares were 40s. 7½d. and Dowty Group 10s. shares active around 47s. Ruston & Hornsby at 27s. 9d. held all but a small part of their recent rise.

There was a tendency to take profits in steel shares, because the dividend announcements show few surprises. Apparently there has been assumptions in some quarters that, now the nationalisation threat is over, the steel companies would follow a more liberal dividend policy. It has to be remembered, however, that most steel companies face heavy expenditure on expansion plans or new plant. It is being assumed in the City that many of them will raise large sums next year by issues made to shareholders on attractive terms.